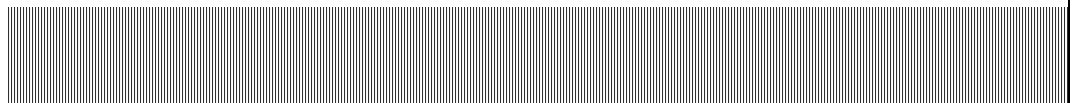
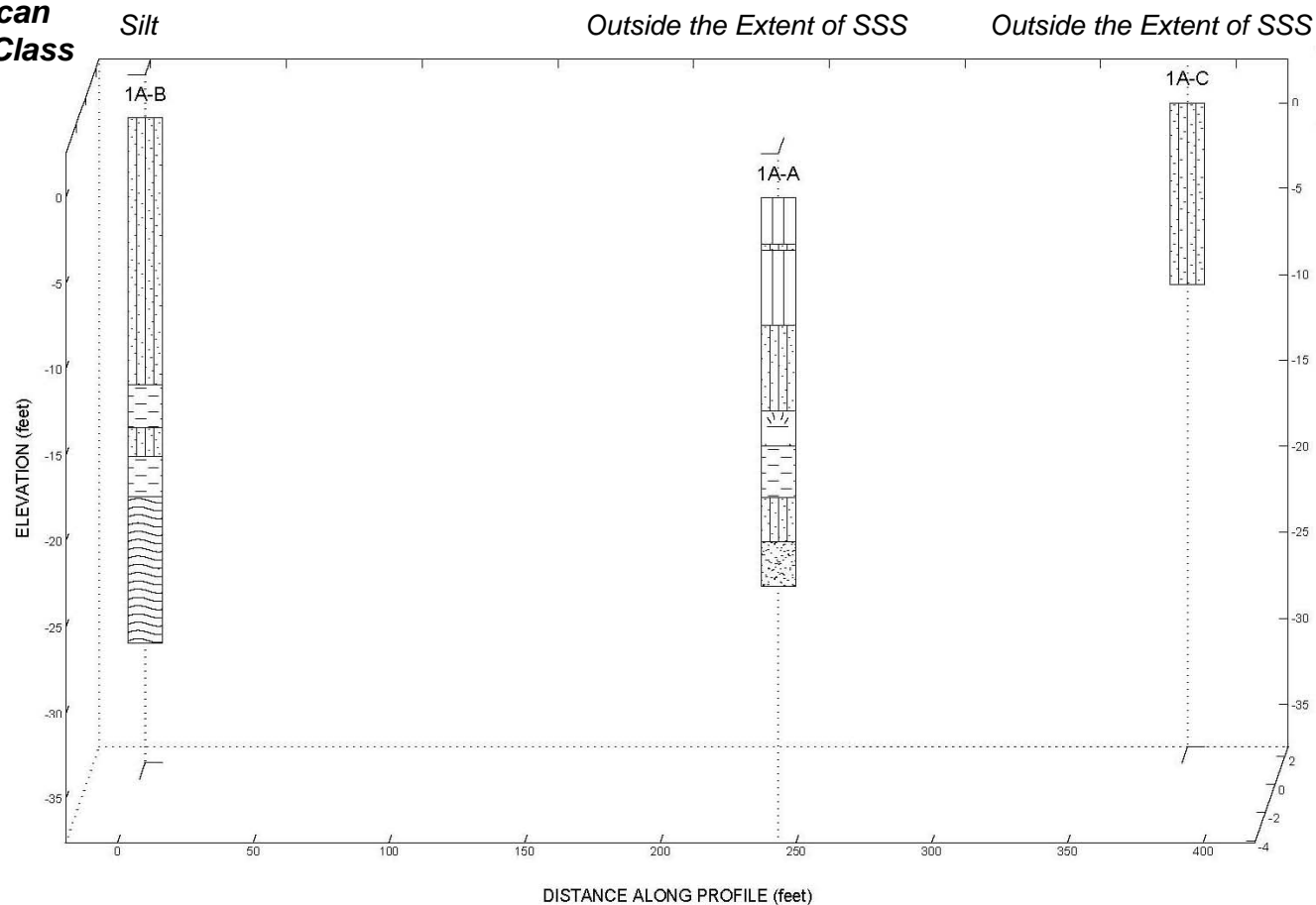


## Chapter 16 Figures

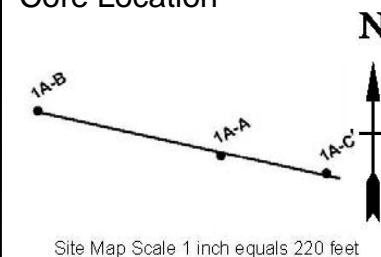


# Side Scan Sonar Class



## Legend

### Core Location

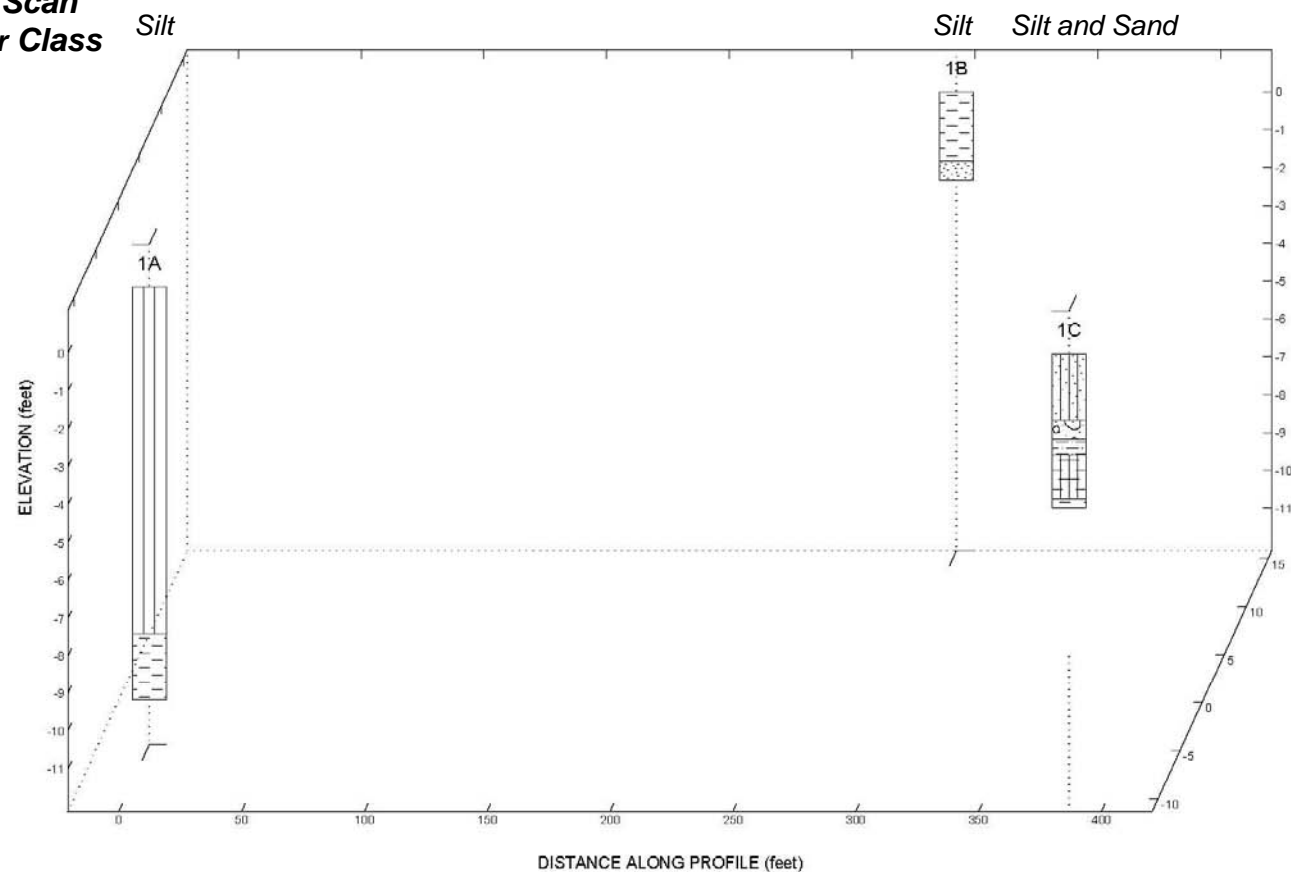


Comparison of Side Scan Sonar Sediment Class and Subsurface Sediment Texture by Coring  
Location: Mile 0  
Lower Passaic River Restoration Project

Figure 16-1a

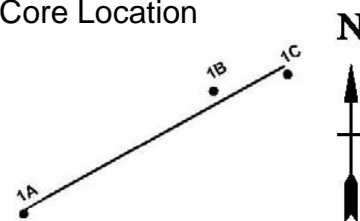
2009

# Side Scan Sonar Class



## Legend

### Core Location

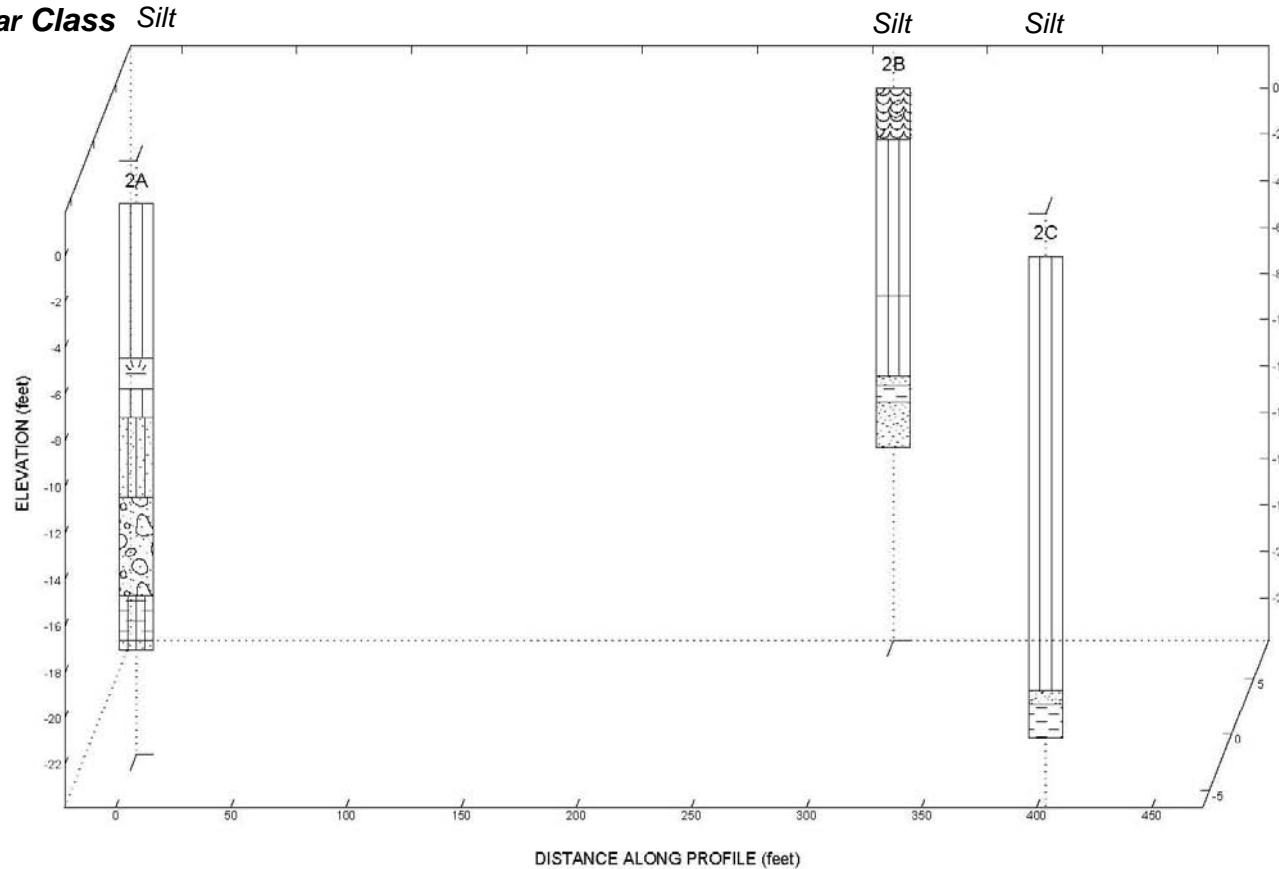


Comparison of Side Scan Sonar Sediment Class and Subsurface Sediment Texture by Coring  
Location: Mile 1  
*Lower Passaic River Restoration Project*

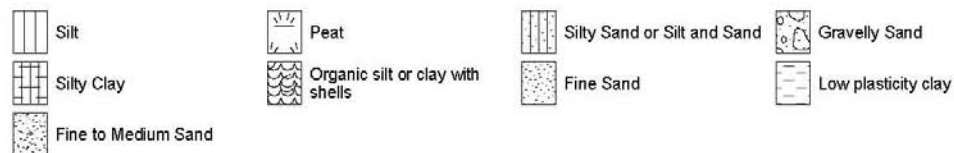
Figure 16-1b

2009

**Side Scan  
Sonar Class Silt**

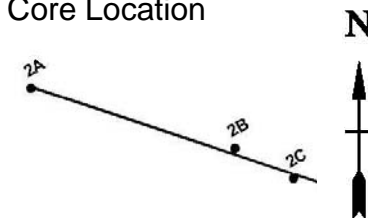


**Field Classification**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 250 feet

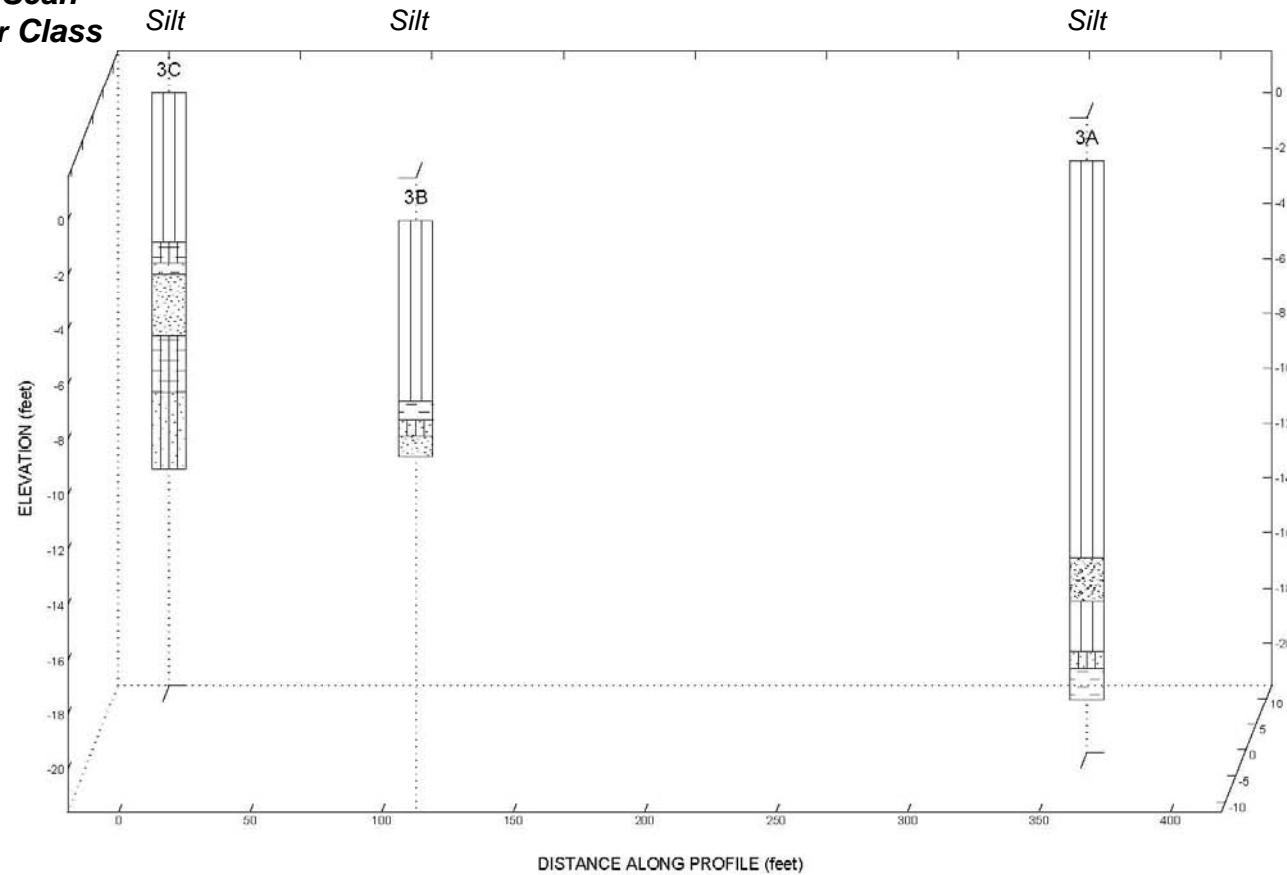


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 2  
*Lower Passaic River Restoration Project*

Figure 16-1c

2009

**Side Scan  
Sonar Class**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 220 feet

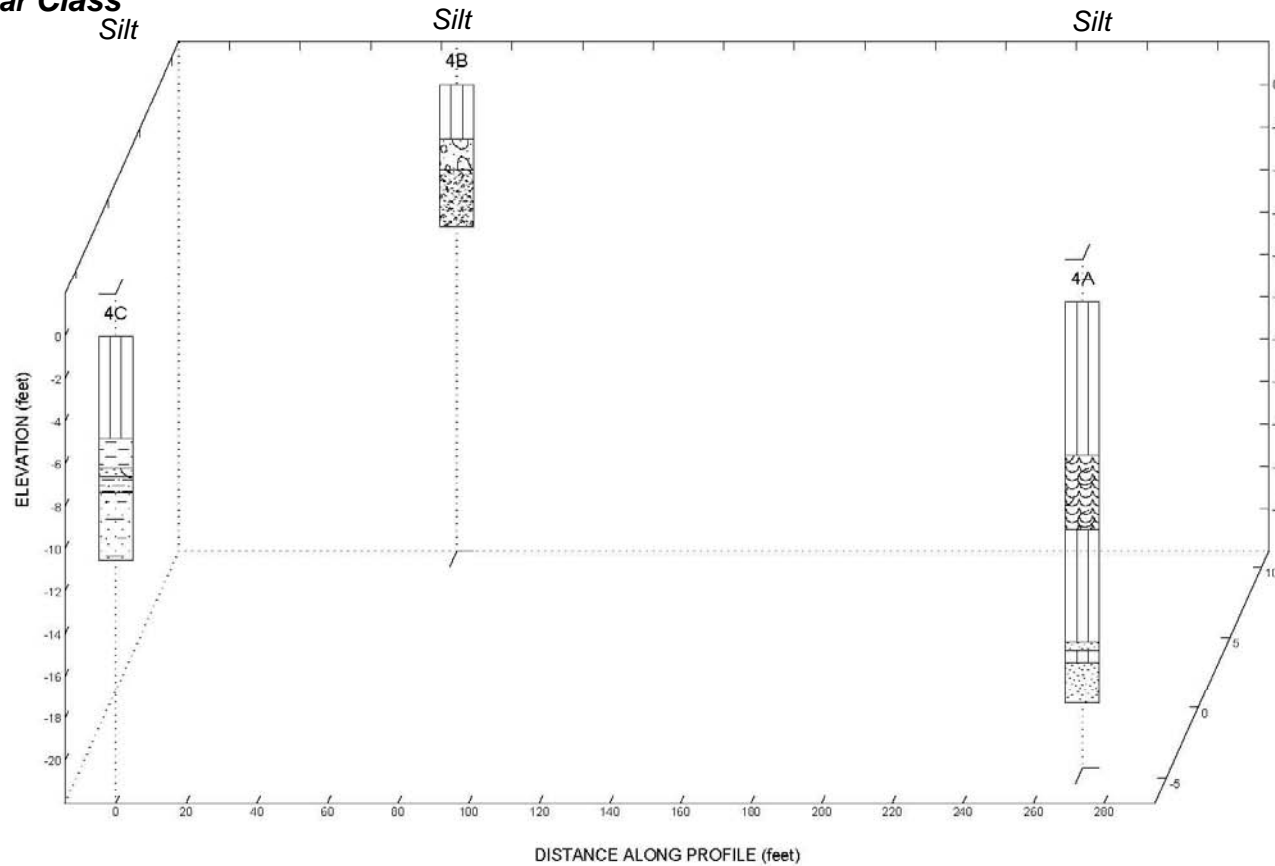


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 3  
*Lower Passaic River Restoration Project*

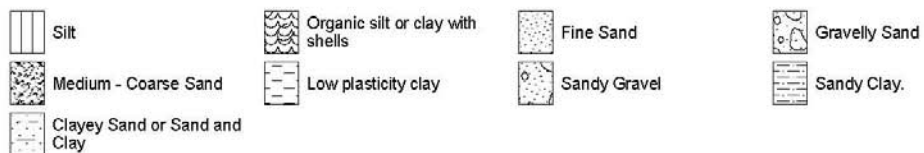
**Figure 16-1d**

2009

# Side Scan Sonar Class

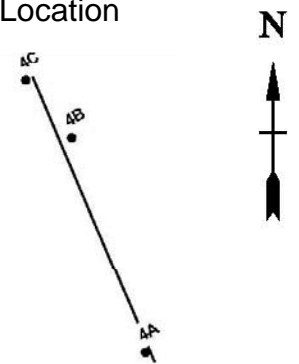


## Field Classification



## Legend

### Core Location



Site Map Scale 1 inch equals 155 feet



## Comparison of Side Scan Sonar Sediment Class and Subsurface Sediment Texture by Coring

Location: Mile 4

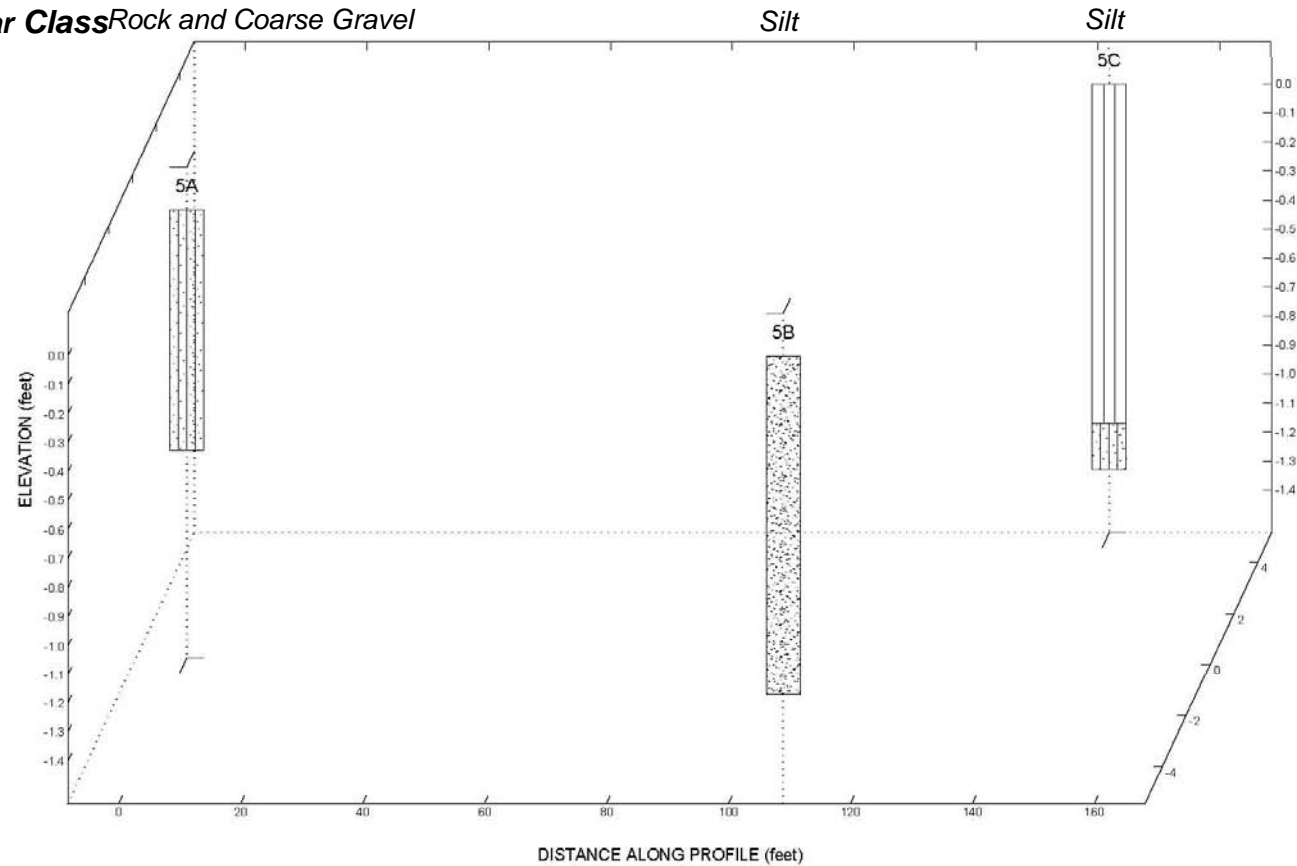
Lower Passaic River Restoration Project

Figure 16-1e

2009

# Side Scan

**Sonar Class** Rock and Coarse Gravel

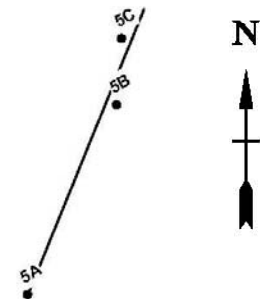


## Field Classification



## Legend

### Core Location



Site Map Scale 1 inch equals 90 feet



## Comparison of Side Scan Sonar Sediment Class and Subsurface Sediment Texture by Coring

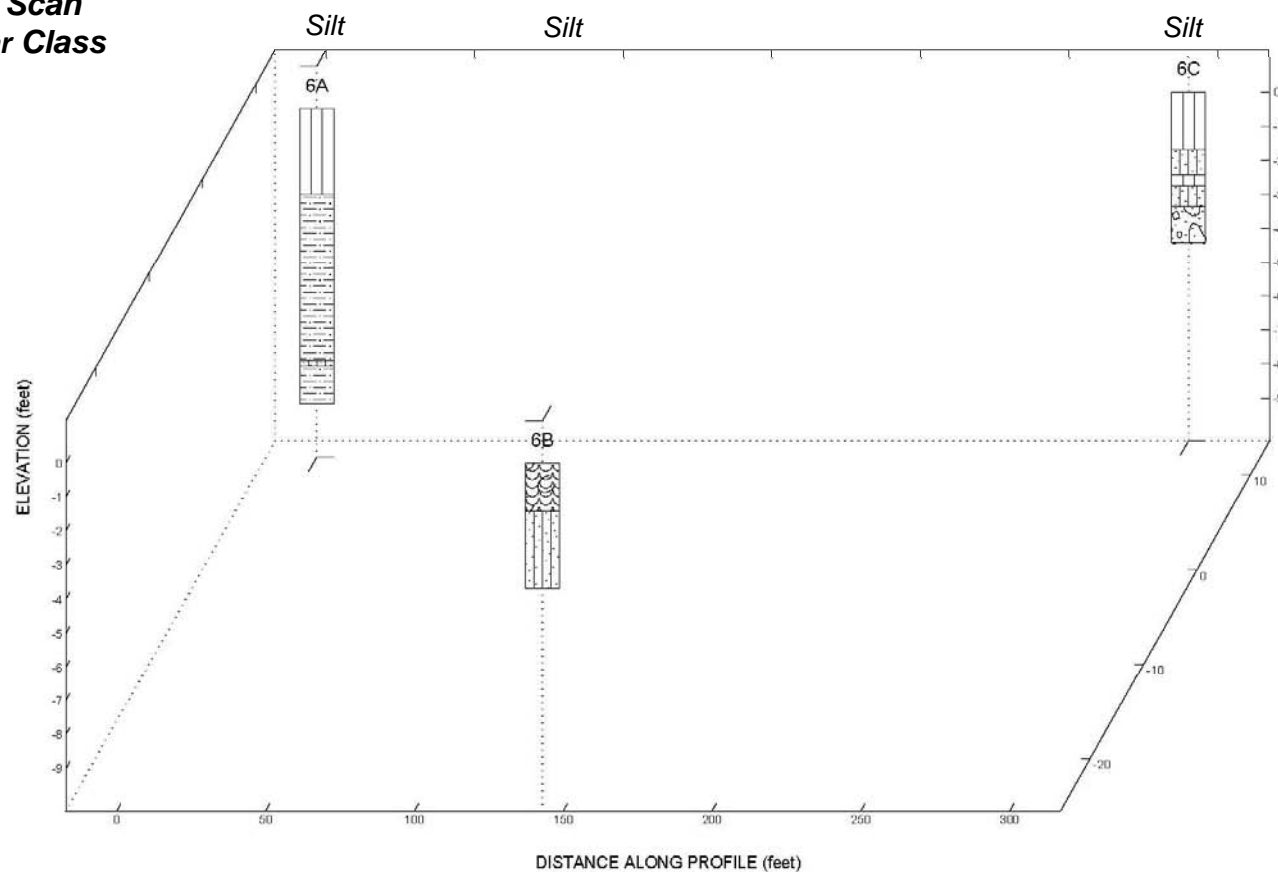
Location: Mile 5

Lower Passaic River Restoration Project

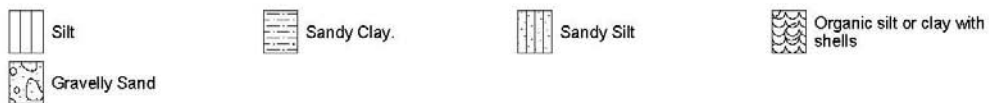
Figure 16-1f

2009

# Side Scan Sonar Class

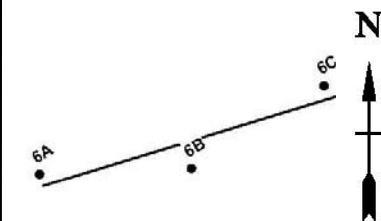


## Field Classification



# Legend

## Core Location



Site Map Scale 1 inch equals 165 feet

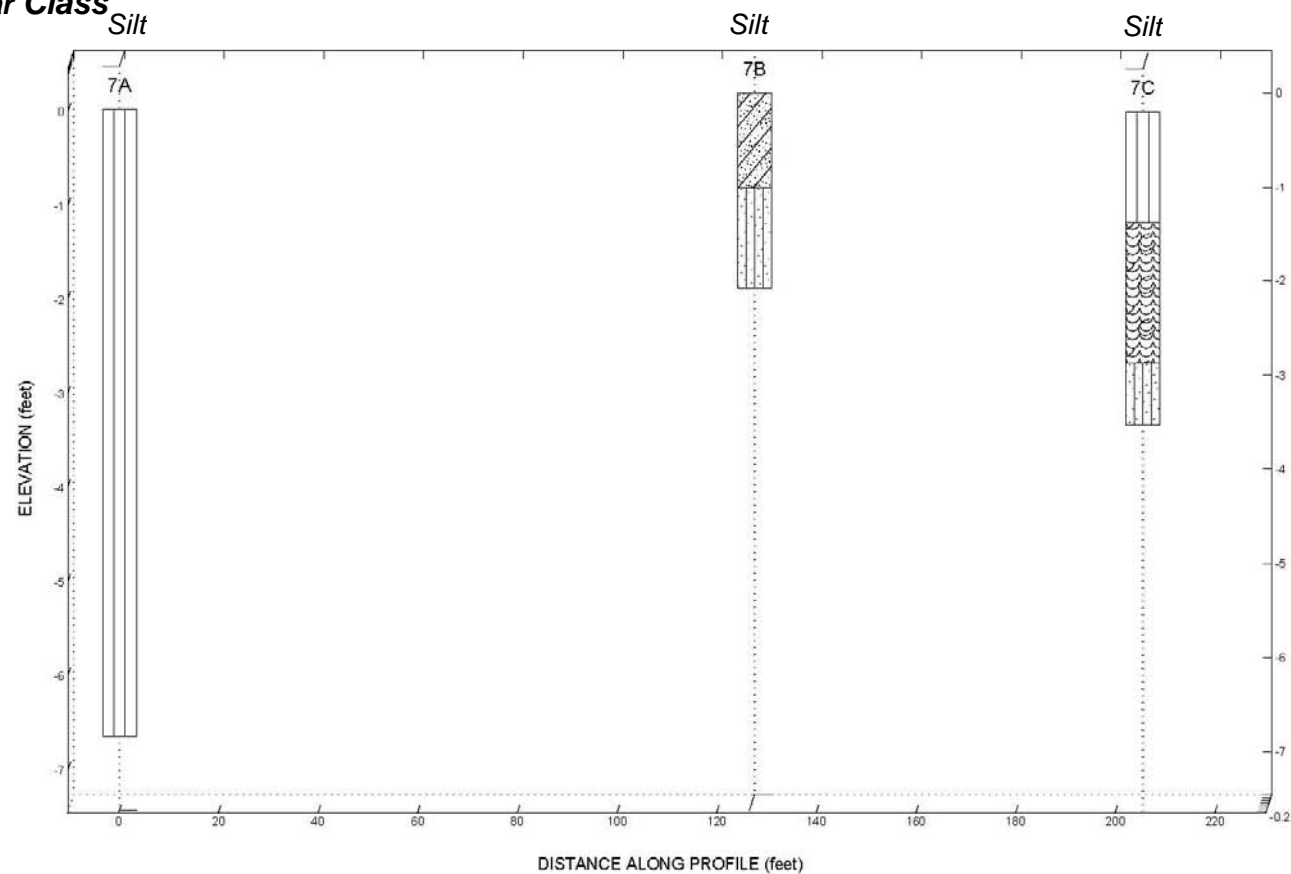


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 6  
*Lower Passaic River Restoration Project*

Figure 16-1g

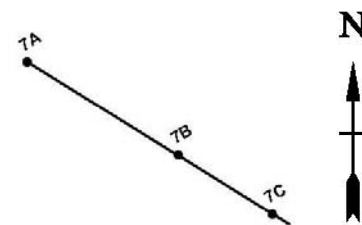
2009

**Side Scan  
Sonar Class**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 120 feet

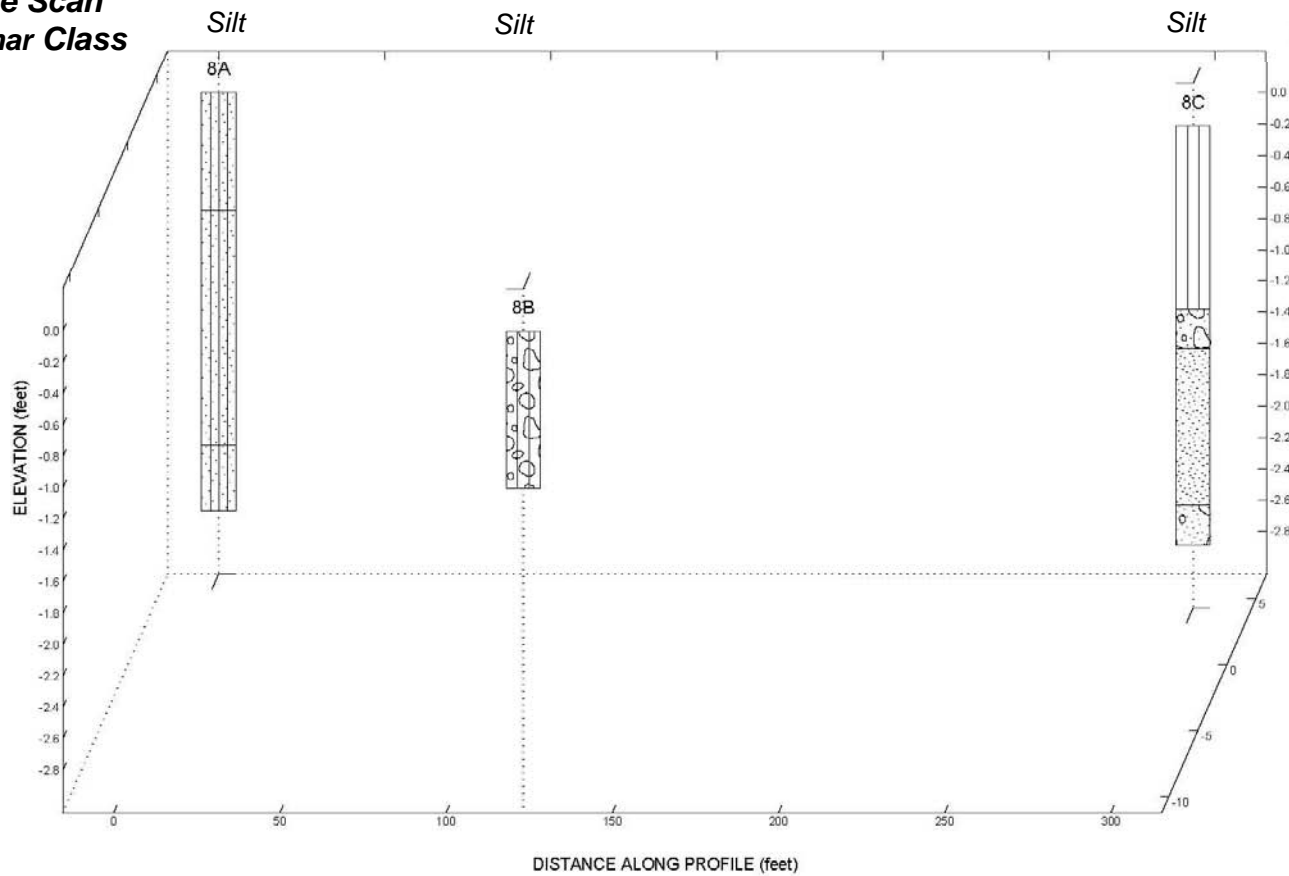


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 7  
*Lower Passaic River Restoration Project*

**Figure 16-1h**

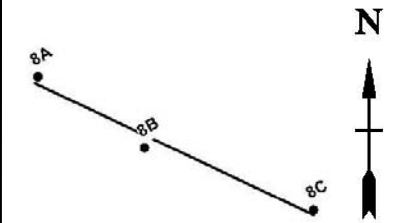
2009

# Side Scan Sonar Class



## Legend

### Core Location



Site Map Scale 1 inch equals 165 feet

### Field Classification



## Comparison of Side Scan Sonar Sediment Class and Subsurface Sediment Texture by Coring

Location: Mile 8

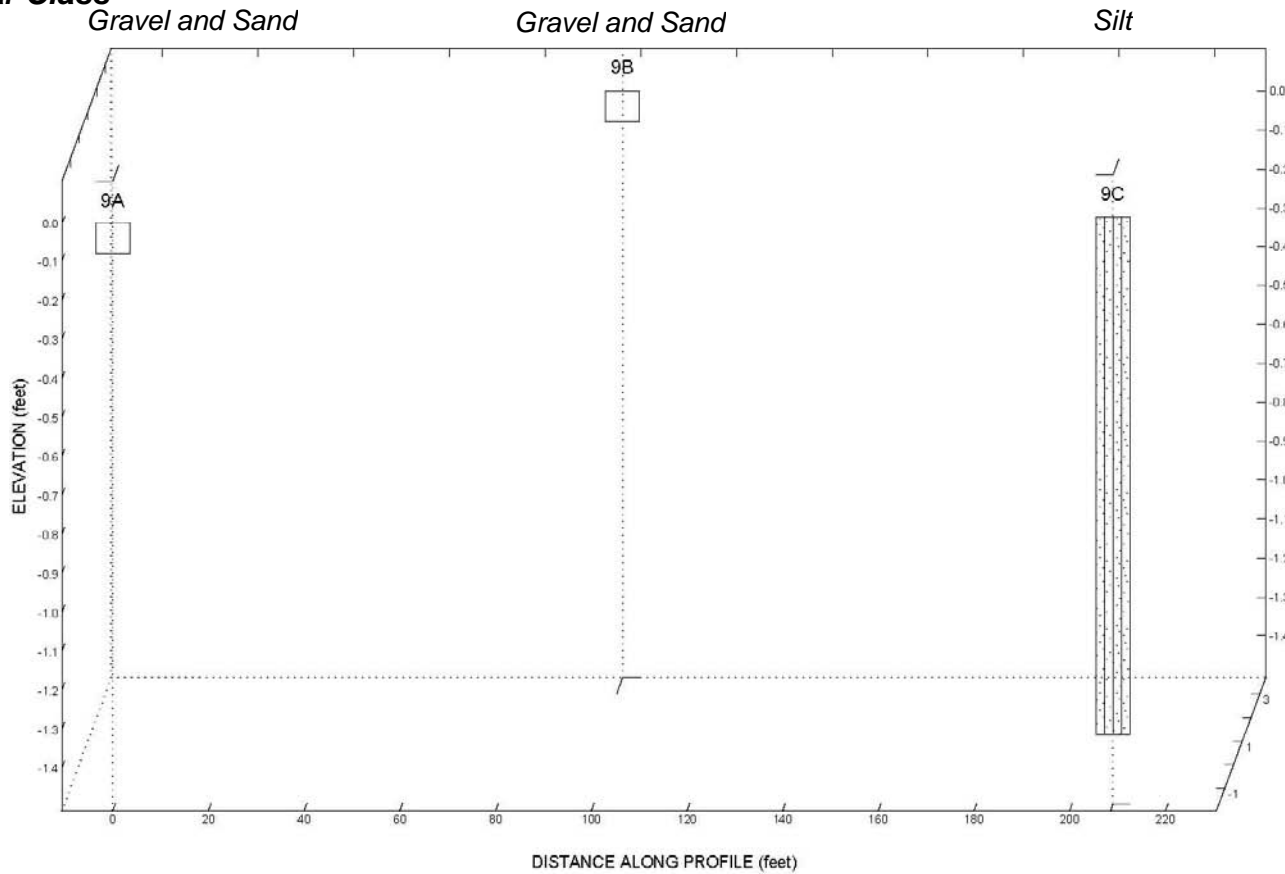
Lower Passaic River Restoration Project

Figure 16-1i

2009

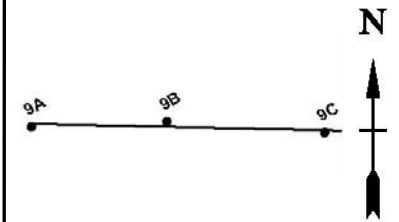


**Side Scan  
Sonar Class**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 165 feet

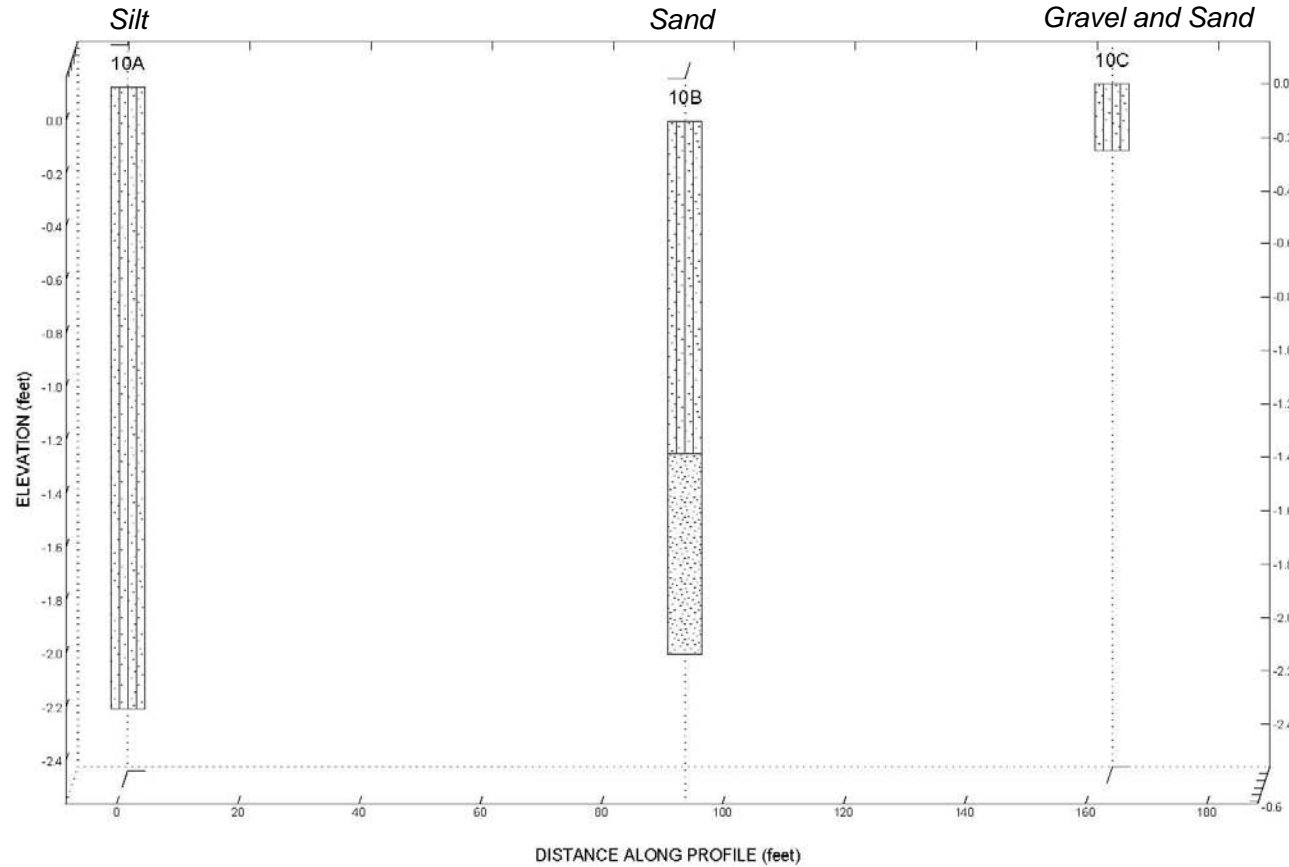


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 9  
*Lower Passaic River Restoration Project*

**Figure 16-1j**

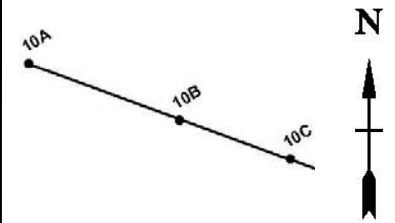
2009

**Side Scan  
Sonar Class**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 100 feet

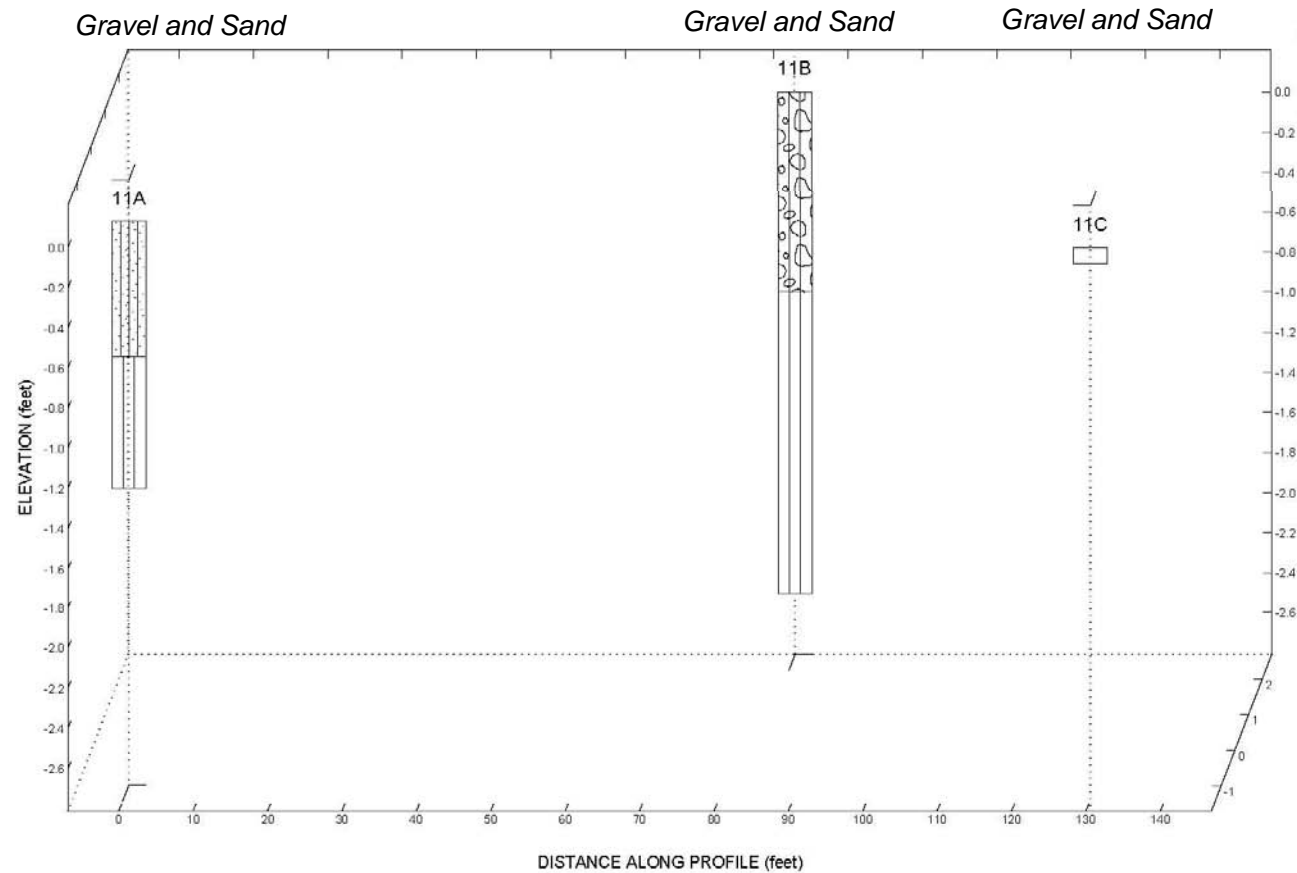


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 10  
*Lower Passaic River Restoration Project*

**Figure 16-1k**

2009

**Side Scan  
Sonar Class**

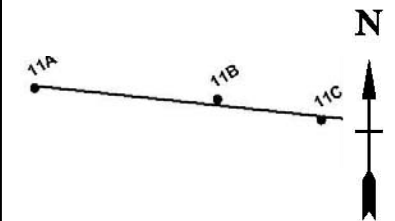


**Field Classification**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 75 feet

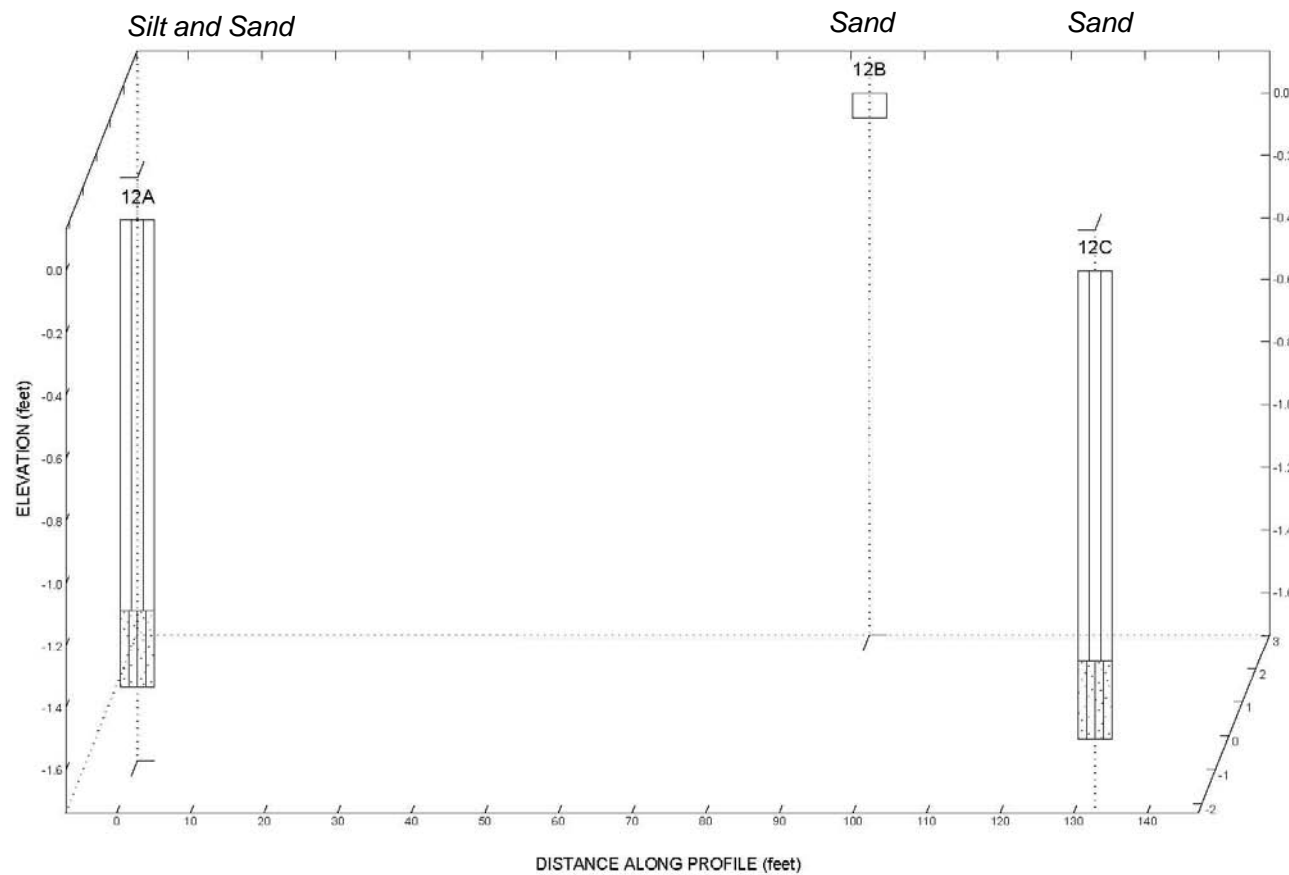


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 11  
*Lower Passaic River Restoration Project*

Figure 16-11

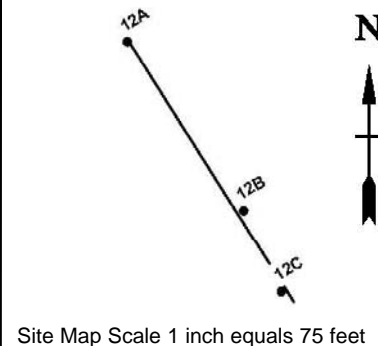
2009

# Side Scan Sonar Class



## Legend

### Core Location

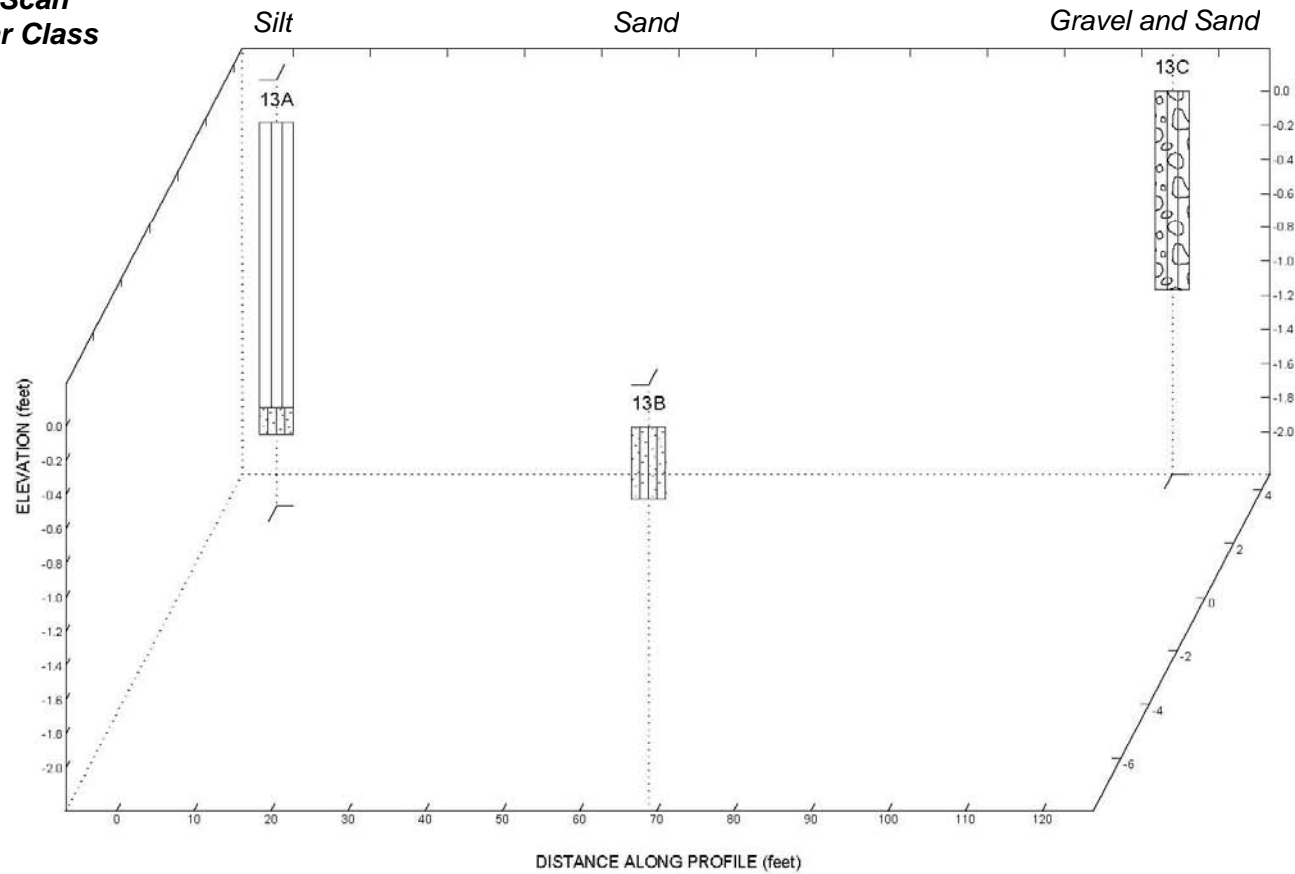


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 12  
*Lower Passaic River Restoration Project*

Figure 16-1m

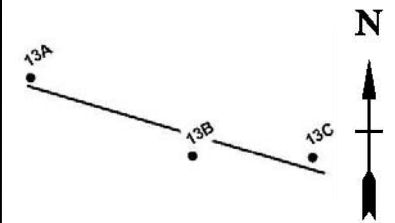
2009

**Side Scan  
Sonar Class**



**Legend**

**Core Location**



**Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring**  
Location: Mile 13  
*Lower Passaic River Restoration Project*

**Figure 16-1n**

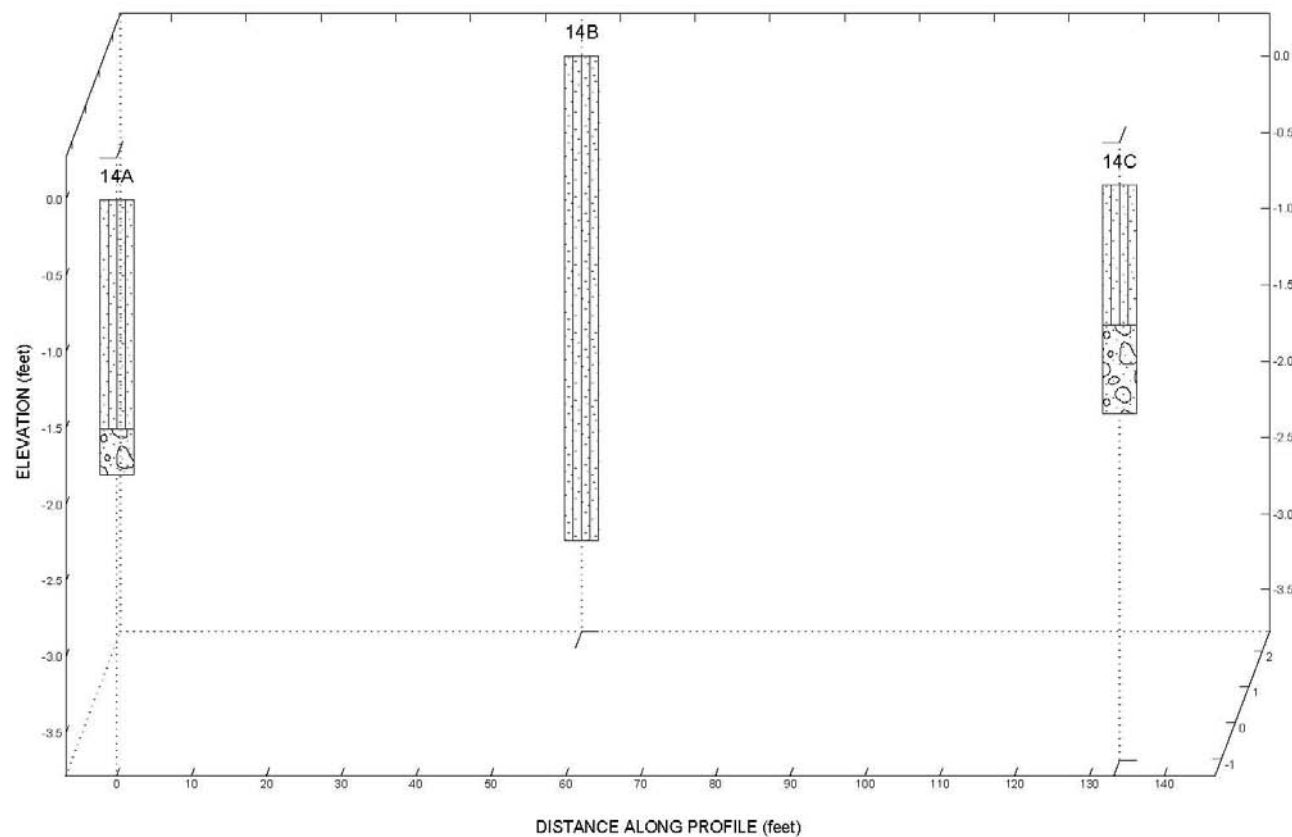
2009

**Side Scan  
Sonar Class**

Silt and Sand

Silt and Sand

Silt and Sand

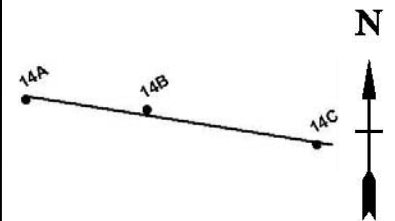


**Field Classification**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 75 feet



Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 14  
Lower Passaic River Restoration Project

Figure 16-1o

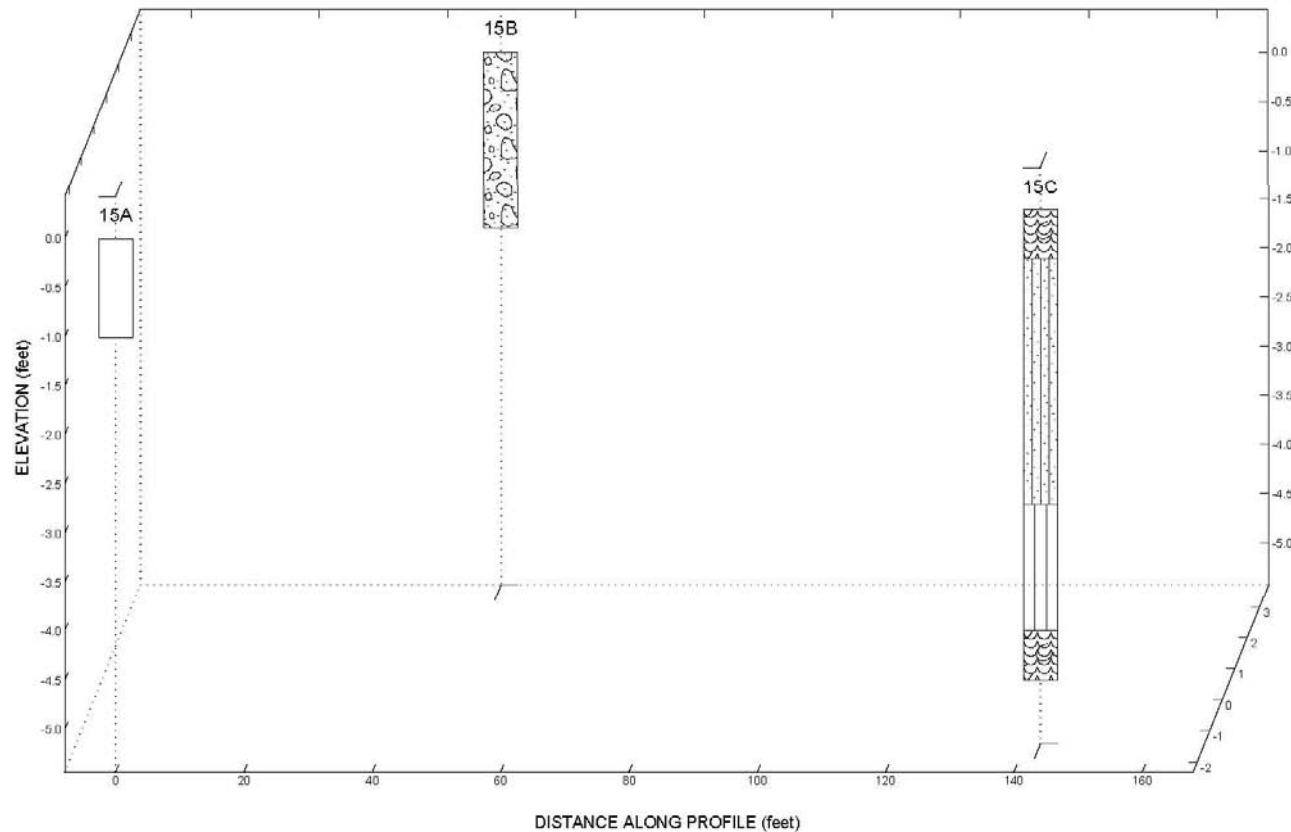
2009

**Side Scan  
Sonar Class**

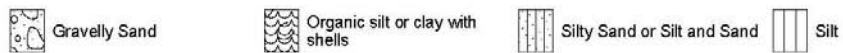
Rock and Coarse Gravel

Sand

Silt and Sand

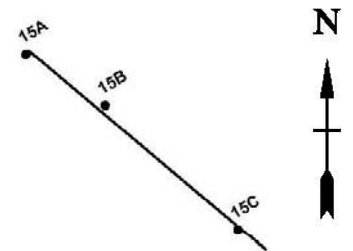


**Field Classification**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 90 feet

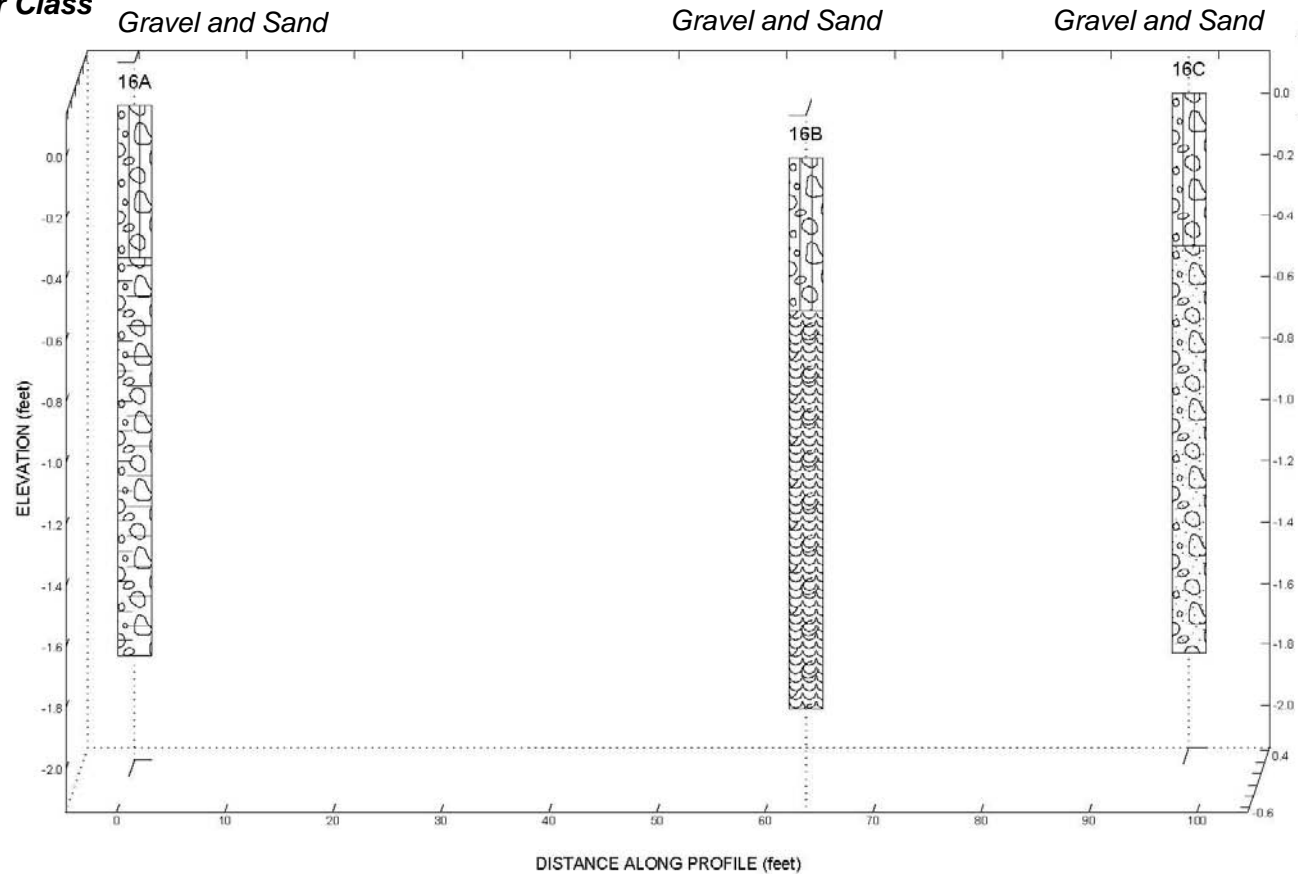


Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 15  
*Lower Passaic River Restoration Project*

Figure 16-1p

2009

**Side Scan  
Sonar Class**

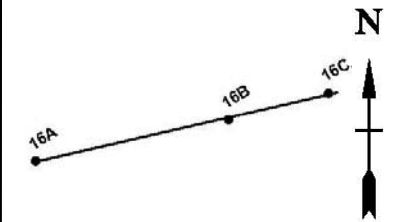


**Field Classification**



**Legend**

**Core Location**



Site Map Scale 1 inch equals 55 feet



Comparison of Side Scan Sonar Sediment Class and Subsurface  
Sediment Texture by Coring  
Location: Mile 16  
*Lower Passaic River Restoration Project*

Figure 16-1q

2009



## Legend

### Mass Per Unit Area (g/m<sup>2</sup>)

- <0.01
- 0.01 - 0.032
- 0.032 - 0.1
- 0.1 - 0.32
- 0.32 - 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 3100<sup>a</sup>

### Core Type

#### Continuous

- ≤ 10 ng/g at core bottom
- ◐ > 10 ng/g at core bottom, Bottom Conc < 50% Max Conc
- > 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Interpolated<sup>b</sup>

- △ ≤ 10 ng/g at core bottom
- ◐ > 10 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ▲ > 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

### Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ● | 5 - 10  |
| △ | ◐ | 10 - 15 |
| △ | ○ | 15 - 20 |

### Rejected Measurement(s) Present in Core<sup>c</sup>

\*

### River Mile Marker

+ 1

Notes:

<sup>a</sup> MPA scale was combined since only 4 data present in this range.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.



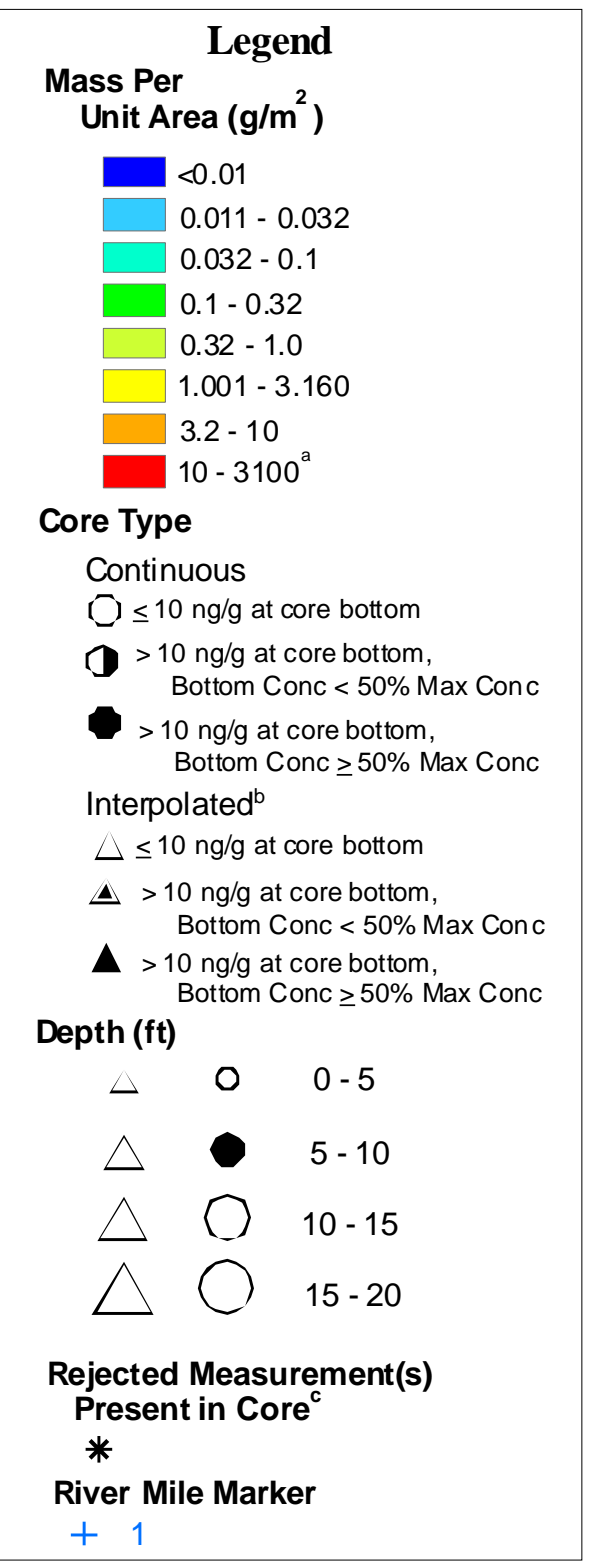
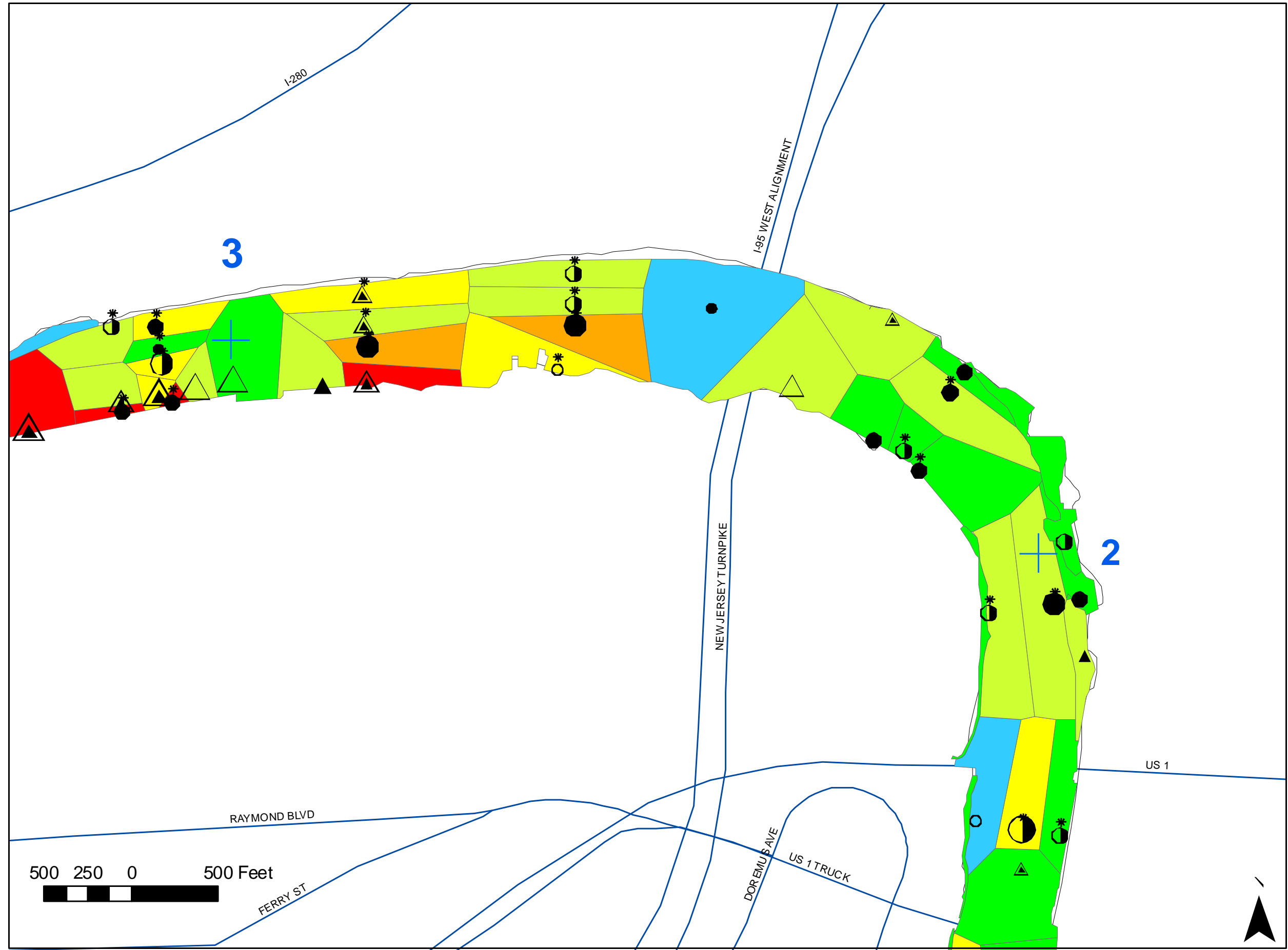
Total DDT (Sum of 4,4'-DDT, 4,4'-DDD and 4,4'-DDE)  
Mass Per Unit Area - Mile 1 to 2

Figure 16-2a  
Page 1 of 6

2009

Lower Passaic River Restoration Project

P:\028592 4Mapping\CSM\_MassBalance\DDT\_Thiessen\_RM 2\_3.mxd



Notes:

<sup>a</sup> MPA scale was combined since only 4 data present in this range.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.



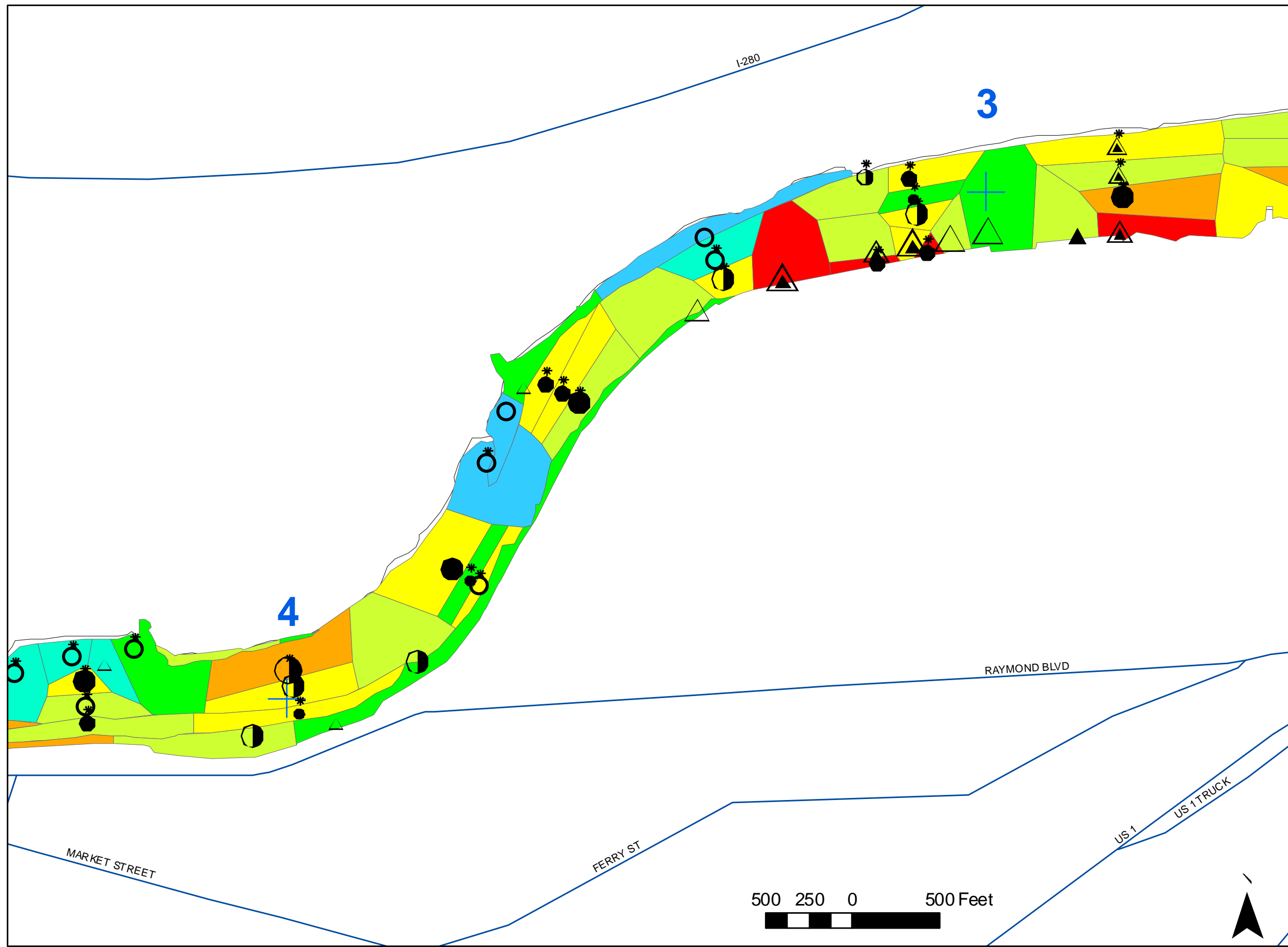
Total DDT (Sum of 4,4'-DDT, 4,4'-DDD and 4,4'-DDE) Mass Per Unit Area - Mile 2 to 3

Lower Passaic River Restoration Project

Figure 16-2b  
Page 2 of 6

2009

Map Document: P:\02 85924\Mapping\CSM\_MassBalance\DDT\_Thiessen\_RM3\_4.mxd



**Legend**

**Mass Per Unit Area (g/m<sup>2</sup>)**

<0.01

0.011 - 0.032

0.032 - 0.1

0.1 - 0.32

0.32 - 1.0

1.001 - 3.160

3.2 - 10

10 - 3100<sup>a</sup>

**Core Type**

**Continuous**

○ ≤ 10 ng/g at core bottom

◐ > 10 ng/g at core bottom, Bottom Conc < 50% Max Conc

● > 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Interpolated<sup>b</sup>**

△ ≤ 10 ng/g at core bottom

◕ > 10 ng/g at core bottom, Bottom Conc < 50% Max Conc

▲ > 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (ft)**

△

○

0 - 5

△

●

5 - 10

△

◐

10 - 15

△

○

15 - 20

**Rejected Measurement(s) Present in Core<sup>c</sup>**

\*

River Mile Marker

+ 1

Notes:

<sup>a</sup> MPA scale was combined since only 4 data present in this range.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

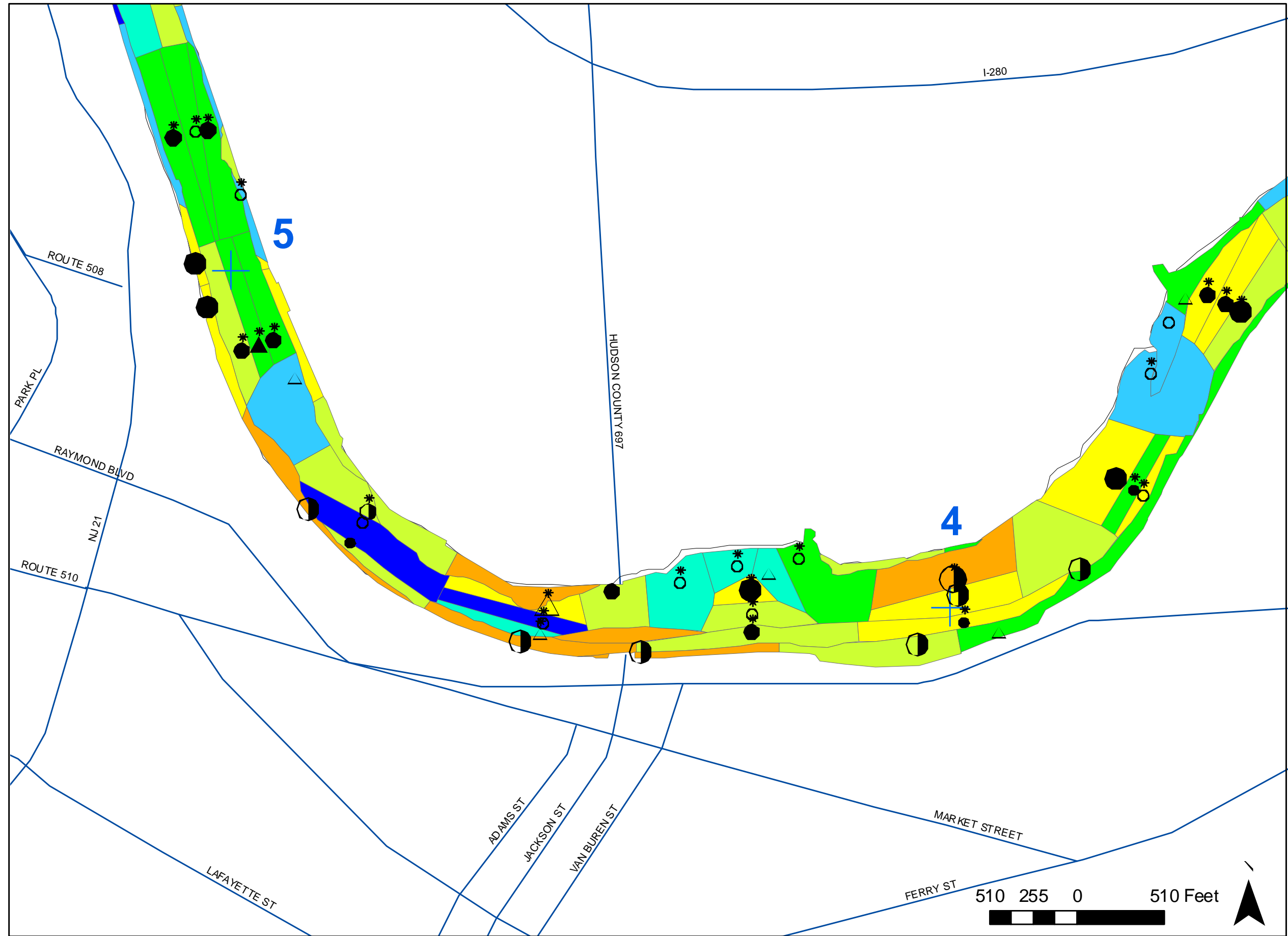
<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.



Total DDT (Sum of 4,4'-DDT, 4,4'-DDD and 4,4'-DDE) Mass Per Unit Area - Mile 3 to 4

Lower Passaic River Restoration Project

P:\028592.4\Maping\CSM\_Ma ssBalance\DDT\_Thiessen\_RM 4\_5.mxd



**Legend**

**Mass Per Unit Area (g/m<sup>2</sup>)**

<0.01

0.011 - 0.032

0.032 - 0.1

0.1 - 0.32

0.32 - 1.0

1.001 - 3.160

3.2 - 10

10 - 3100<sup>a</sup>

**Core Type**

**Continuous**

○ ≤ 10 ng/g at core bottom

◐ > 10 ng/g at core bottom, Bottom Conc < 50% Max Conc

◑ > 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Interpolated<sup>b</sup>**

△ ≤ 10 ng/g at core bottom

◡ > 10 ng/g at core bottom, Bottom Conc < 50% Max Conc

▲ > 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (ft)**

△

○

0 - 5

△

◑

5 - 10

△

◐

10 - 15

△

○

15 - 20

**Rejected Measurement(s) Present in Core<sup>c</sup>**

\*

River Mile Marker

+ 1

Notes:

<sup>a</sup> MPA scale was combined since only 4 data present in this range.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

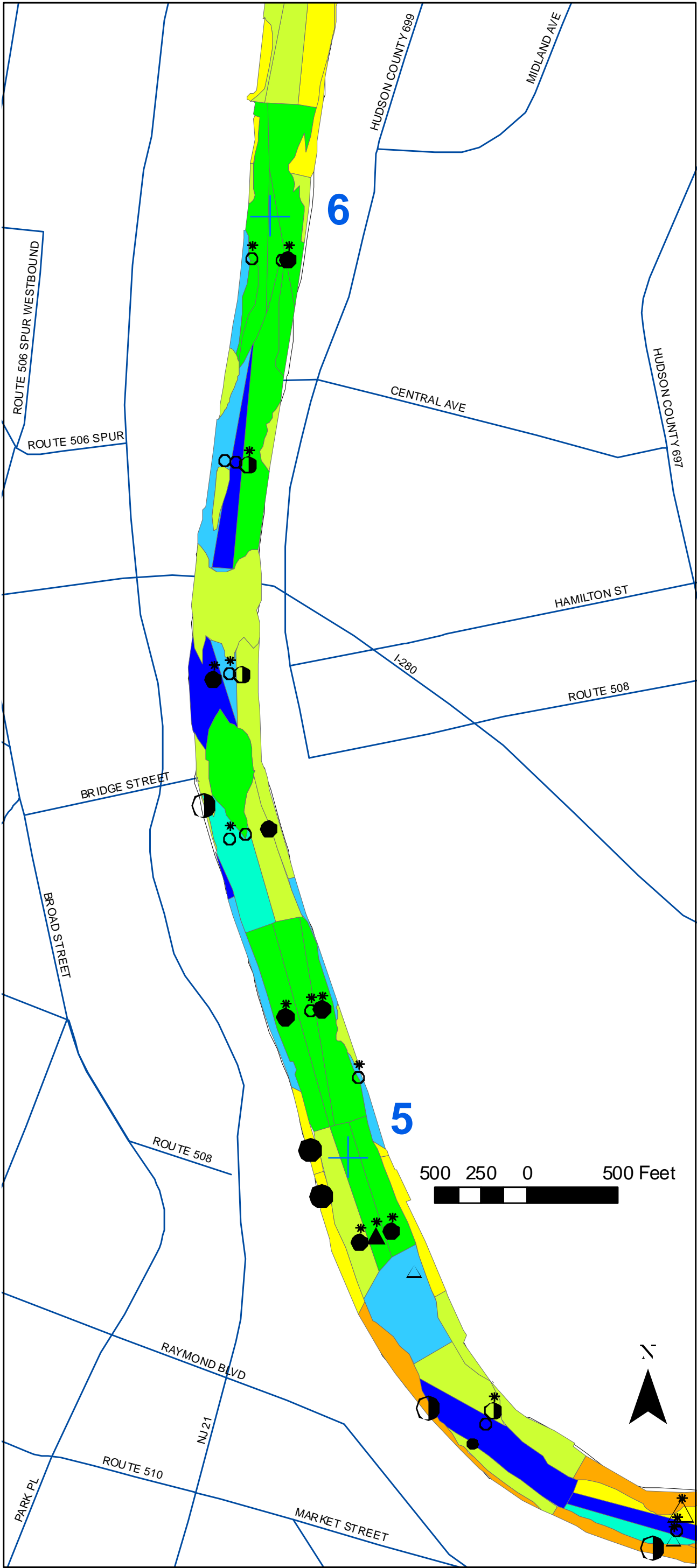
<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.

Total DDT (Sum of 4,4'-DDT, 4,4'-DDD and 4,4'-DDE) Mass Per Unit Area - Mile 4 to 5

Lower Passaic River Restoration Project

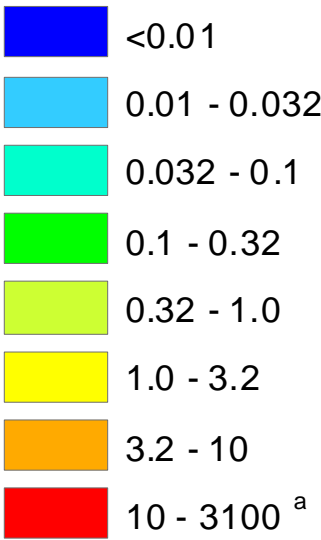


map Document: P:\02 85924\Mapping\CSM\_MassBalance\DDT\_Thiessen\_RM15\_6.mxd



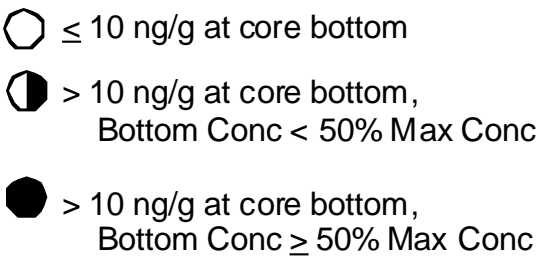
## Legend

### Mass Per Unit Area ( $\text{g/m}^2$ )

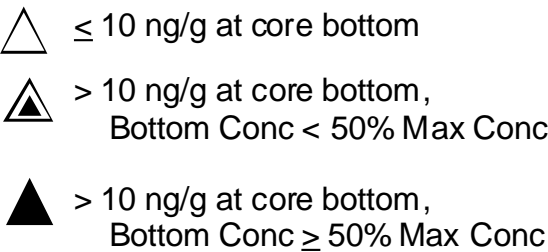


### Core Type

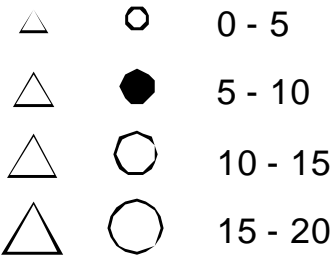
#### Continuous



#### Interpolated<sup>b</sup>



### Depth (feet)



### Rejected Measurement(s) Present in Core<sup>c</sup>

\*

### River Mile Marker

+ 1

Notes:  
<sup>a</sup> MPA scale was combined since only 4 data present in this range.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.  
<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.



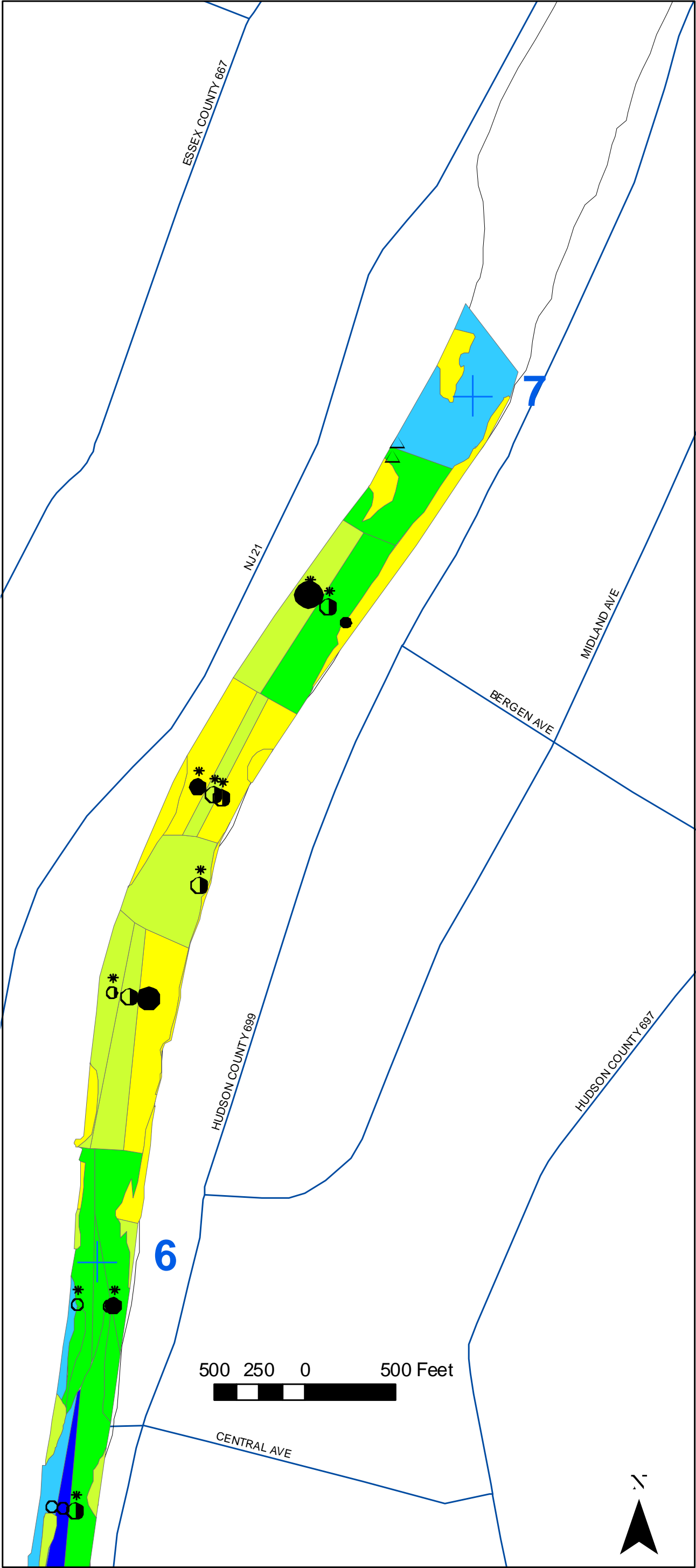
Total DDT (Sum of 4,4'-DDT, 4,4'-DDD and 4,4'-DDE)  
Mass Per Unit Area - Mile 5 to 6

Lower Passaic River Restoration Project

Figure 16-2e  
Page 5 of 6

2009

Map Document: P:\02 85924\Mapping\CSM\_MassBalance\DDT\_Thiessen\_RM6\_7.mxd



### Legend

#### Mass Per Unit Area (g/m<sup>2</sup>)

[Dark Blue]	<0.01
[Light Blue]	0.01 - 0.032
[Cyan]	0.032 - 0.1
[Green]	0.1 - 0.32
[Light Green]	0.32 - 1.0
[Yellow]	1.0 - 3.2
[Orange]	3.2 - 10
[Red]	10 - 3100 <sup>a</sup>

#### Core Type

##### Continuous

[Open Circle]	≤ 10 ng/g at core bottom
[Half-Filled Circle]	> 10 ng/g at core bottom, Bottom Conc < 50% Max Conc
[Solid Black Circle]	> 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

##### Interpolated<sup>b</sup>

[Open Triangle]	≤ 10 ng/g at core bottom
[Half-Filled Triangle]	> 10 ng/g at core bottom, Bottom Conc < 50% Max Conc
[Solid Black Triangle]	> 10 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Depth (feet)

[Open Triangle]	[Open Circle]	0 - 5
[Open Triangle]	[Solid Black Circle]	5 - 10
[Open Triangle]	[Open Circle]	10 - 15
[Open Triangle]	[Open Circle]	15 - 20

#### Rejected Measurement(s) Present in Core<sup>c</sup>

[Asterisk]

#### River Mile Marker

[Blue Plus Sign] 1

Notes:

<sup>a</sup> MPA scale was combined since only 4 data present in this range.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.



Legend

Mass Per Unit Area (mg/m<sup>2</sup>)

- < 0.01
- 0.01 - 0.032
- 0.032 - 0.1
- 0.1 - 0.32
- 0.32 - 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 1300<sup>a</sup>

Core Type

Continuous

- < 2 pg/g at core bottom
- ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

- < 2 pg/g at core bottom
- ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ● | 5 - 10  |
| △ | ◉ | 10 - 15 |
| △ | ◯ | 15 - 20 |

River Mile Marker

+ 1

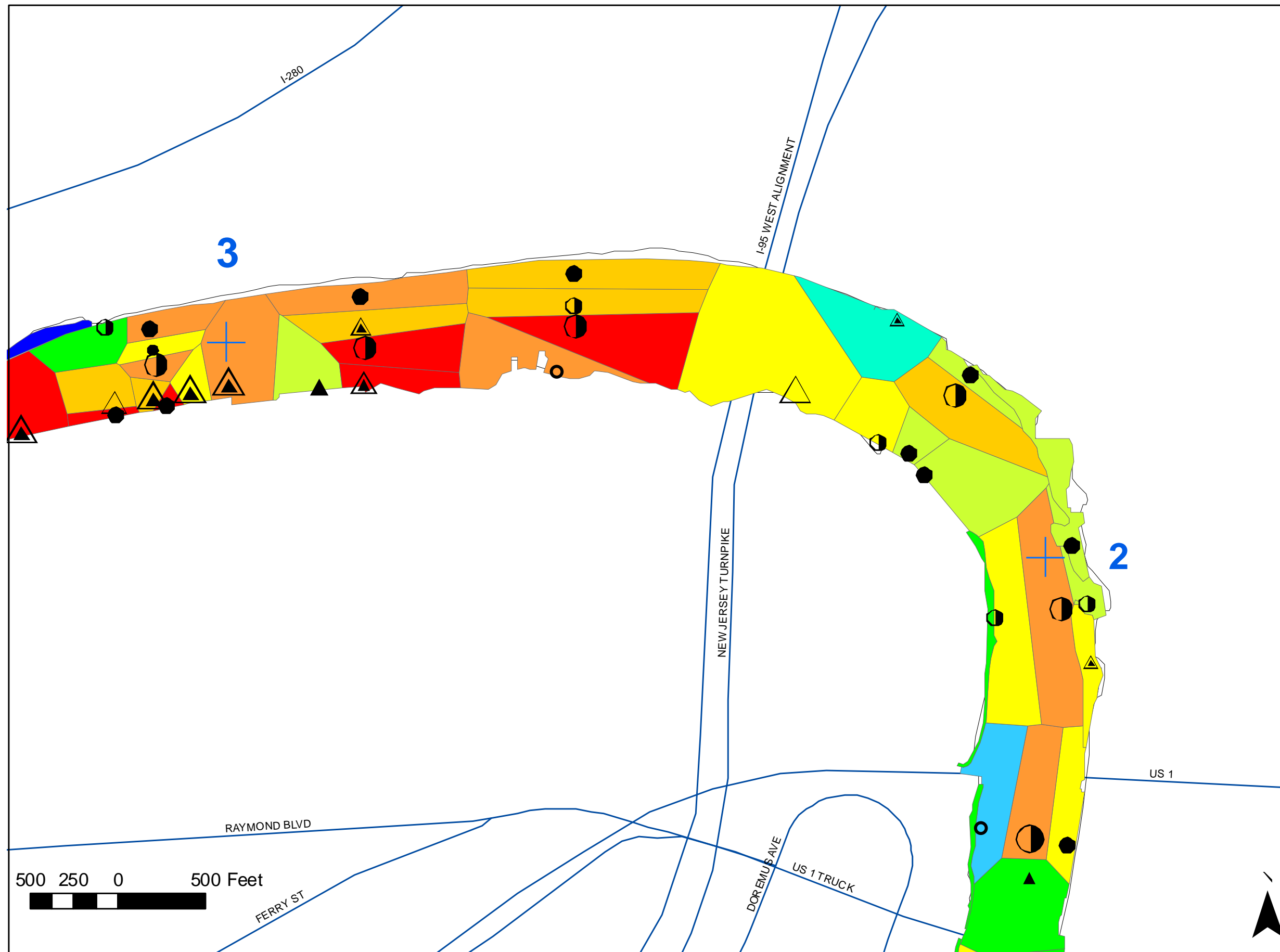
Notes:  
There is no rejected measurement present for 2,3,7,8-TCDD.  
<sup>a</sup> MPA scale was combined since only 9 data present in this range.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.



2,3,7,8-TCDD Mass Per Unit Area - Mile 1 to 2

Lower Passaic River Restoration Project

Map Document: P:\0285924\Mapping\C SM\_MassBalance\TCDD\_Thiessen\_RM2\_3.mxd



### Legend

**Mass Per Unit Area (mg/m<sup>2</sup>)**

<span style="display:inline-block; width:15px; height:15px; background-color:blue;"></span>	< 0.01
<span style="display:inline-block; width:15px; height:15px; background-color:lightblue;"></span>	0.01 - 0.032
<span style="display:inline-block; width:15px; height:15px; background-color:cyan;"></span>	0.032 - 0.1
<span style="display:inline-block; width:15px; height:15px; background-color:green;"></span>	0.1 - 0.32
<span style="display:inline-block; width:15px; height:15px; background-color:lightgreen;"></span>	0.32 - 1.0
<span style="display:inline-block; width:15px; height:15px; background-color:yellow;"></span>	1.0 - 3.2
<span style="display:inline-block; width:15px; height:15px; background-color:orange;"></span>	3.2 - 10
<span style="display:inline-block; width:15px; height:15px; background-color:darkorange;"></span>	10 - 32
<span style="display:inline-block; width:15px; height:15px; background-color:red;"></span>	32 - 1300 <sup>a</sup>

**Core Type**

Continuous

<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span>	< 2 pg/g at core bottom
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%; background-color:gray;"></span>	≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%; background-color:black;"></span>	≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span>	< 2 pg/g at core bottom
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%; background-color:gray;"></span>	≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%; background-color:black;"></span>	≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (feet)**

<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span>	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span>	0 - 5
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span>	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%; background-color:gray;"></span>	5 - 10
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span>	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%; background-color:gray;"></span>	10 - 15
<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%;"></span>	<span style="display:inline-block; width:15px; height:15px; border:1px solid black; border-radius:50%; background-color:gray;"></span>	15 - 20

**River Mile Marker**

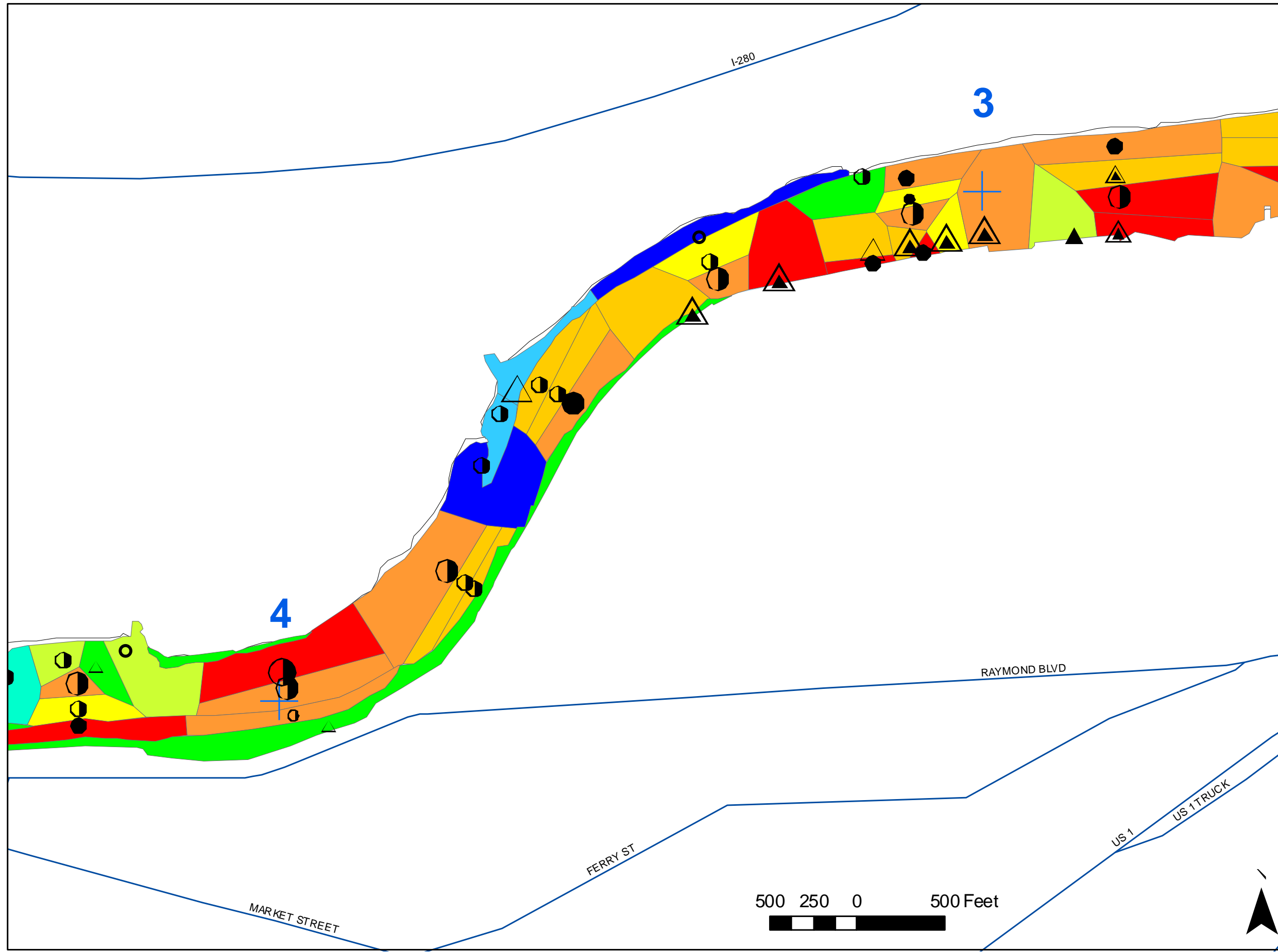
1

Notes:  
There is no rejected measurement present for 2,3,7,8-TCDD.  
<sup>a</sup> MPA scale was combined since only 9 data present in this range.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

2,3,7,8-TCDD Mass Per Unit Area - Mile 2 to 3



P:\028592 4\Mapping\CSM\_MassBalance\TCDD\_Thiessen\_RM3\_4.mxd



### Legend

**Mass Per Unit Area (mg/m<sup>2</sup>)**

- < 0.01
- 0.01 - 0.032
- 0.032 - 0.1
- 0.1 - 0.32
- 0.32 - 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 1300<sup>a</sup>

**Core Type**

Continuous

- < 2 pg/g at core bottom
- ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

- < 2 pg/g at core bottom
- ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (feet)**

△	○	0 - 5
△	●	5 - 10
△	⊗	10 - 15
△	⊙	15 - 20

**River Mile Marker**

+ 1

Notes:

There is no rejected measurement present for 2,3,7,8-TCDD.

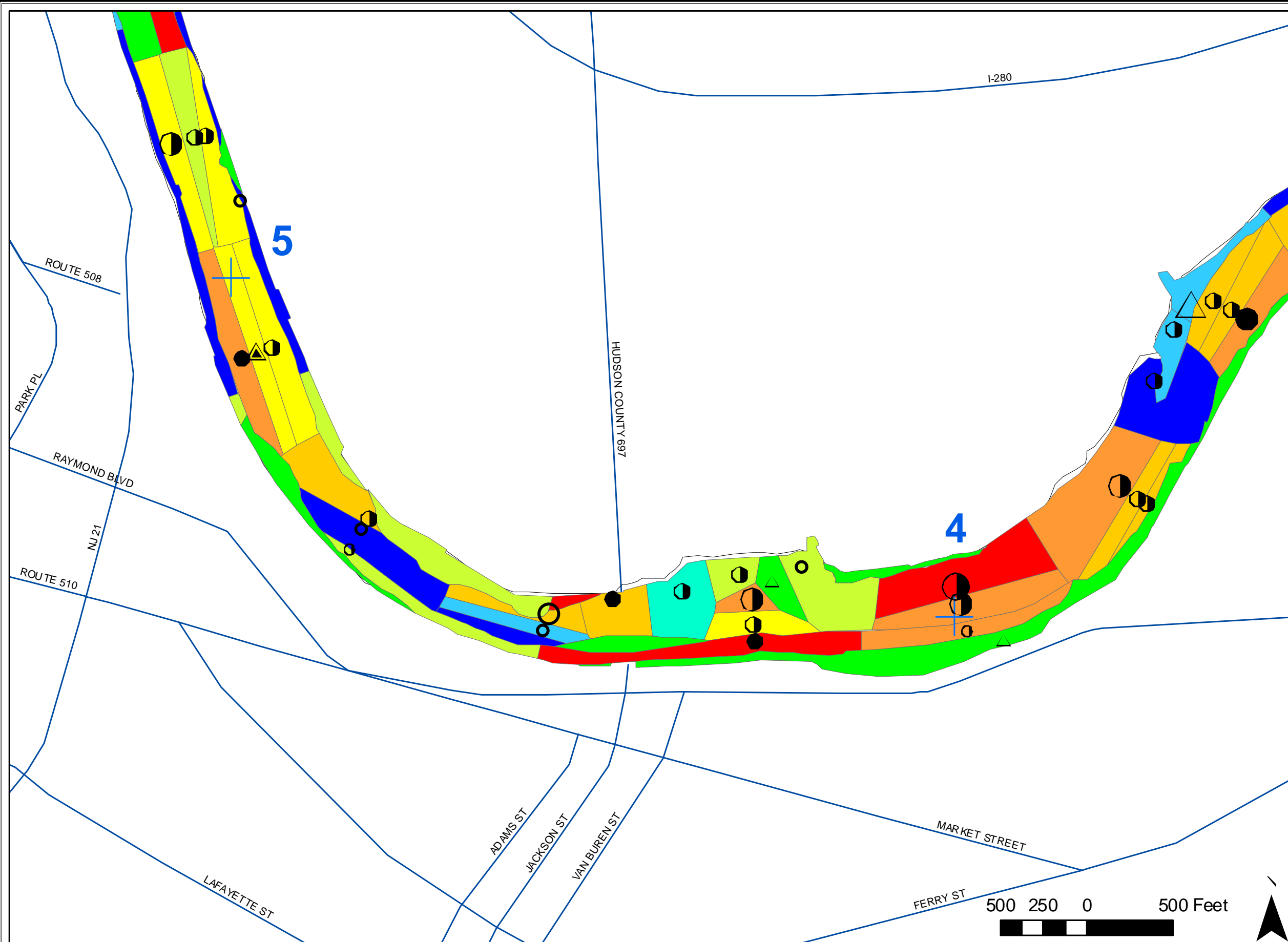
<sup>a</sup> MPA scale was combined since only 9 data present in this range.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.



2,3,7,8-TCDD Mass Per Unit Area - Mile 3 to 4

Lower Passaic River Restoration Project



### Legend

**Mass Per Unit Area (mg/m<sup>2</sup>)**

- < 0.01
- 0.01 - 0.032
- 0.032 - 0.1
- 0.1 - 0.32
- 0.32 - 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 1300<sup>a</sup>

**Core Type**

Continuous

- < 2 pg/g at core bottom
- ◐ ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

- △ < 2 pg/g at core bottom
- ◐ ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ▲ ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (feet)**

△	○	0 - 5
△	●	5 - 10
△	◐	10 - 15
△	○	15 - 20

**River Mile Marker**

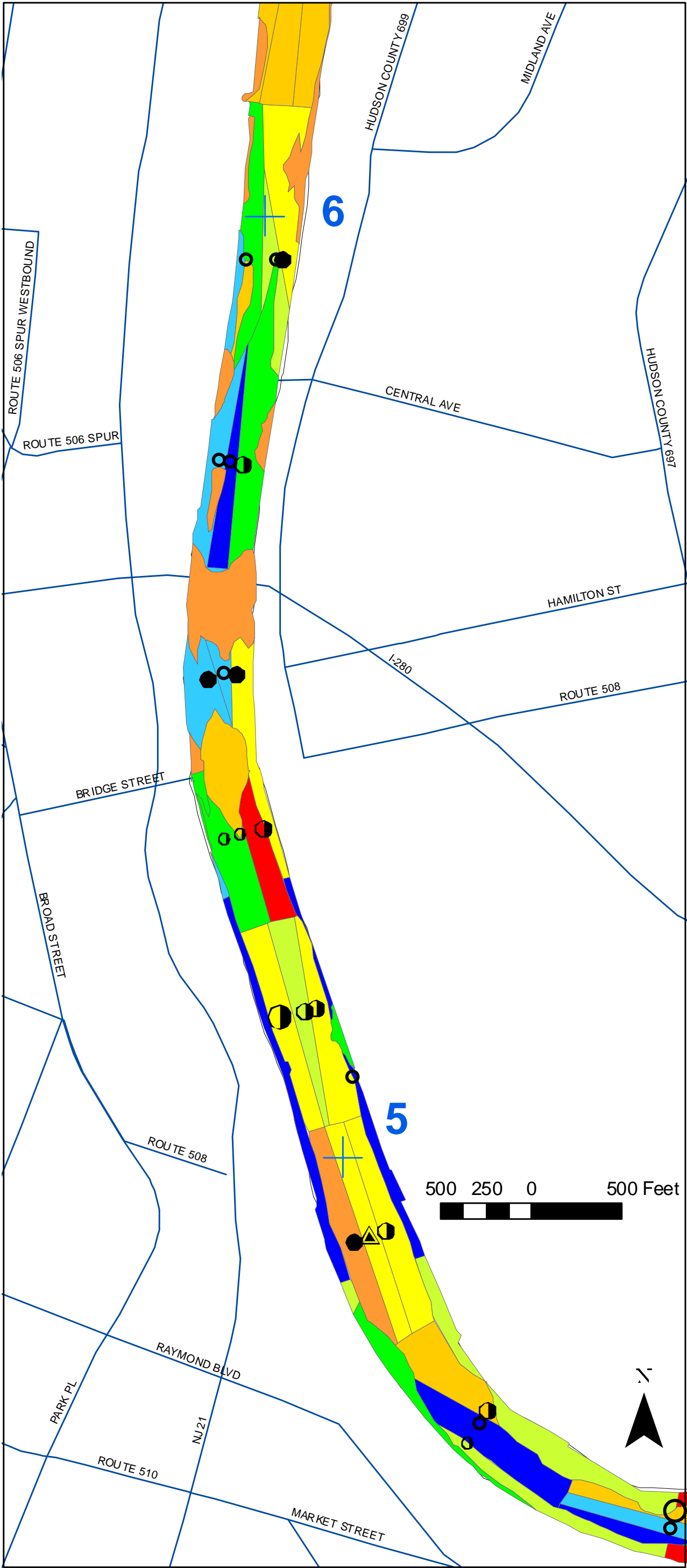
+ 1

Notes:

There is no rejected measurement present for 2,3,7,8-TCDD.

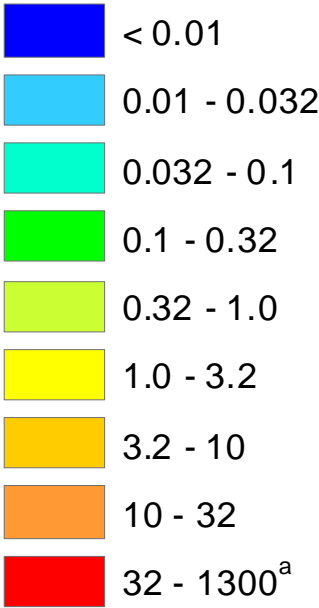
<sup>a</sup>MPA scale was combined since only 9 data present in this range.

<sup>b</sup>Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.



## Legend

### Mass Per Unit Area (mg/m<sup>2</sup>)



### Core Type

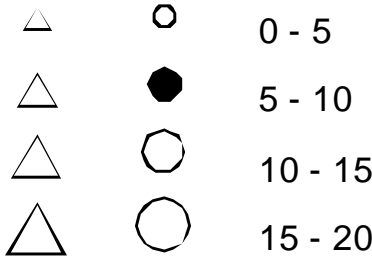
#### Continuous

- < 2 pg/g at core bottom
- ◐ ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ◑ ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Interpolated<sup>b</sup>

- △ < 2 pg/g at core bottom
- ◕ ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ▲ ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Depth (feet)



### River Mile Marker



Notes:  
There is no rejected measurement present for 2,3,7,8-TCDD.  
<sup>a</sup> MPA scale was combined since only 9 data present in this range.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.



2,3,7,8-TCDD Mass Per Unit Area - Mile 5 to 6

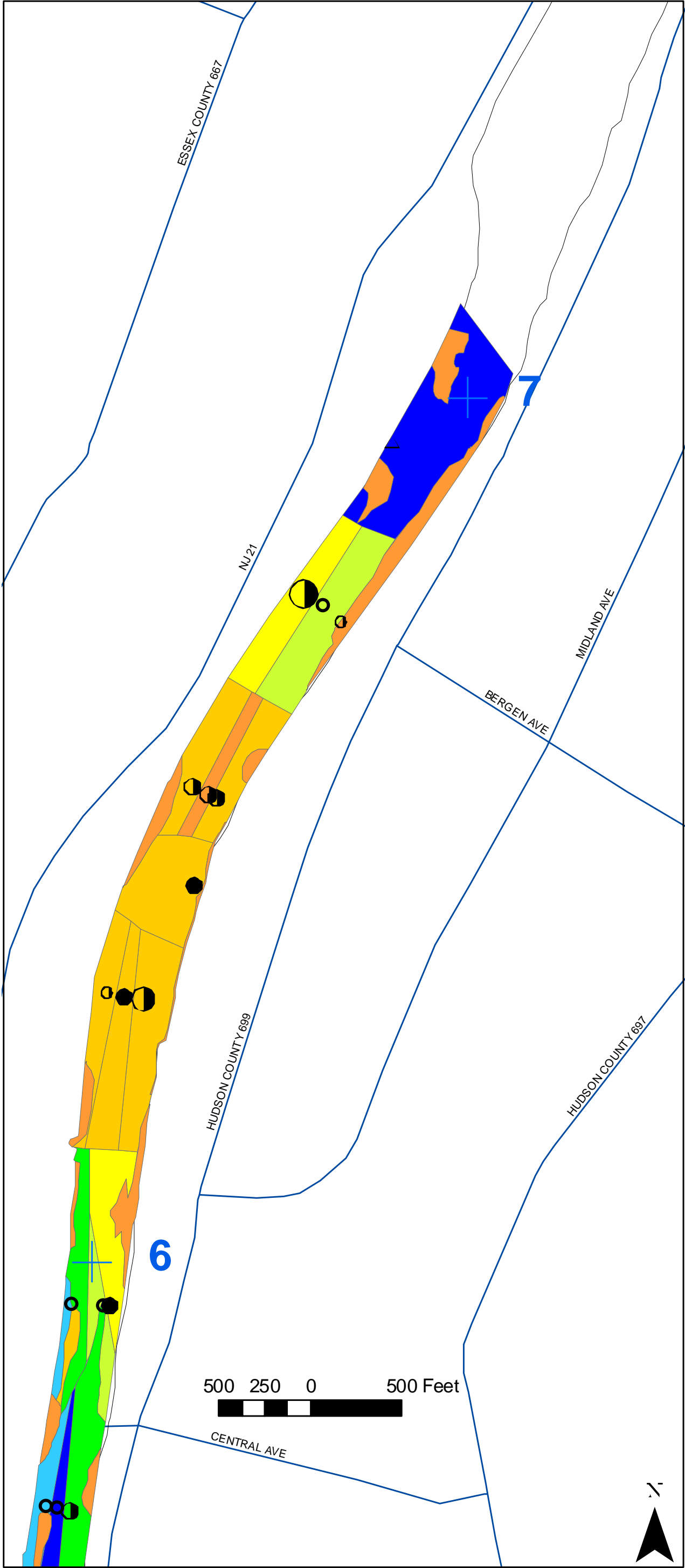
Figure 16-3e  
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Lower Passaic River Restoration Project

P:\028592 4Mapping\CSM MassBalance\TCDD Thiessen\_RM5\_6.mxd

Map Document: P:\0 285924\Mapping\CSM\_MassBalance\TCDD\_TCDD\_Thiessen\_RM6\_7.mxd



## Legend

### Mass Per Unit Area (mg/m<sup>2</sup>)

- < 0.01
- 0.01 - 0.032
- 0.032 - 0.1
- 0.1 - 0.32
- 0.32 - 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 1300<sup>a</sup>

### Core Type

#### Continuous

- < 2 pg/g at core bottom
- ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Interpolated<sup>b</sup>

- < 2 pg/g at core bottom
- ≥ 2 pg/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 2 pg/g at core bottom, Bottom Conc ≥ 50% Max Conc

### Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ● | 5 - 10  |
| △ | ⊙ | 10 - 15 |
| △ | ⊗ | 15 - 20 |

### River Mile Marker

- + 1

Notes:  
There is no rejected measurement present for 2,3,7,8-TCDD.  
<sup>a</sup> MPA scale was combined since only 9 data present in this range.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

2,3,7,8-TCDD Mass Per Unit Area - Mile 6 to 7





Legend

Mass Per Unit Area (g/m<sup>2</sup>)

- < 0.32
- 0.32- 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 36<sup>a</sup>

Core Type

Continuous

- < 125 ng/g at core bottom
- ≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

- < 125 ng/g at core bottom
- ≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ● | 5 - 10  |
| △ | ○ | 10 - 15 |
| △ | ○ | 15 - 20 |

Rejected Measurement(s) Present in Core<sup>c</sup>

\*

River Mile Marker

+ 1

Notes:  
<sup>a</sup> MPA scale was combined since only 1 data point is higher than 32 g/m<sup>2</sup>.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.  
<sup>c</sup> Rejected measurement present in one or more segments for one or more analytes. Rejected values were replaced with an interpolated value based on adjoining segments in the core.

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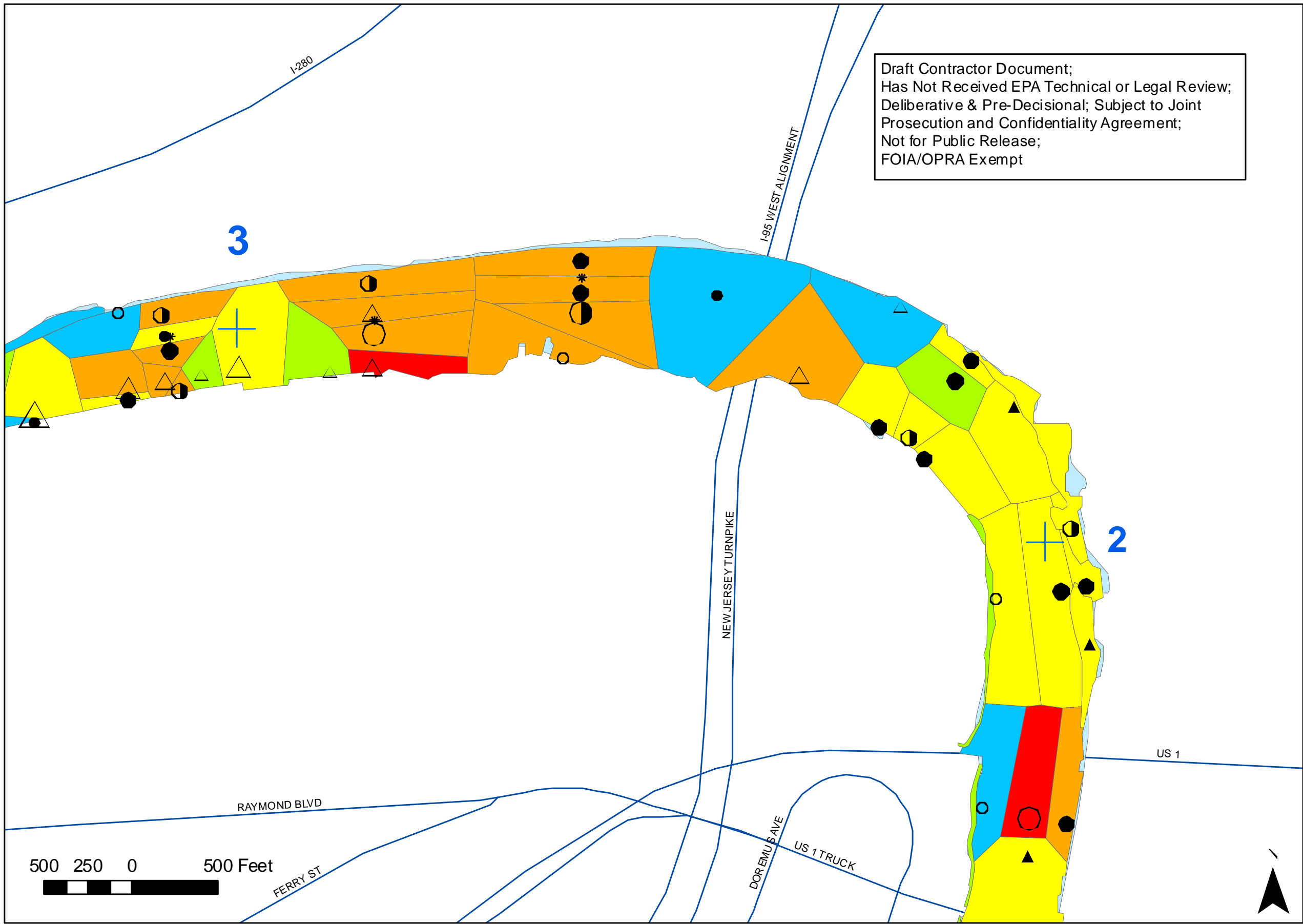
Sum of Aroclors 1248, 1254 and 1260  
Mass Per Unit Area - Mile 1 to 2

Figure 16-4a  
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Lower Passaic River Restoration Project

Map Document: P:\0285924\Mapping\CSM\_MassBalance\PCBSum\_Thiessen\_RM2\_3.mxd



**Legend**

**Mass Per Unit Area (g/m<sup>2</sup>)**

< 0.32

0.32 - 1.0

1.0 - 3.2

3.2 - 10

10 - 36

**Core Type**

**Continuous**

< 125 ng/g at core bottom

≥ 125 ng/g at core bottom,  
Bottom Conc < 50% Max Conc

≥ 125 ng/g at core bottom,  
Bottom Conc ≥ 50% Max Conc

**Interpolated<sup>1</sup>**

< 125 ng/g at core bottom

≥ 125 ng/g at core bottom,  
Bottom Conc < 50% Max Conc

≥ 125 ng/g at core bottom,  
Bottom Conc ≥ 50% Max Conc

**Depth (ft)**

0 - 5

5 - 10

10 - 15

15 - 20

**Rejected Measurement(s) Present in Core**

\*

**River Mile Marker**

+

1

**Notes:**

<sup>a</sup> MPA scale was combined since only 1 data point is higher than 32 g/m<sup>2</sup>.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected measurement present in one or more segments for one or more analytes. Rejected values were replaced with an interpolated value based on adjoining segments in the core.



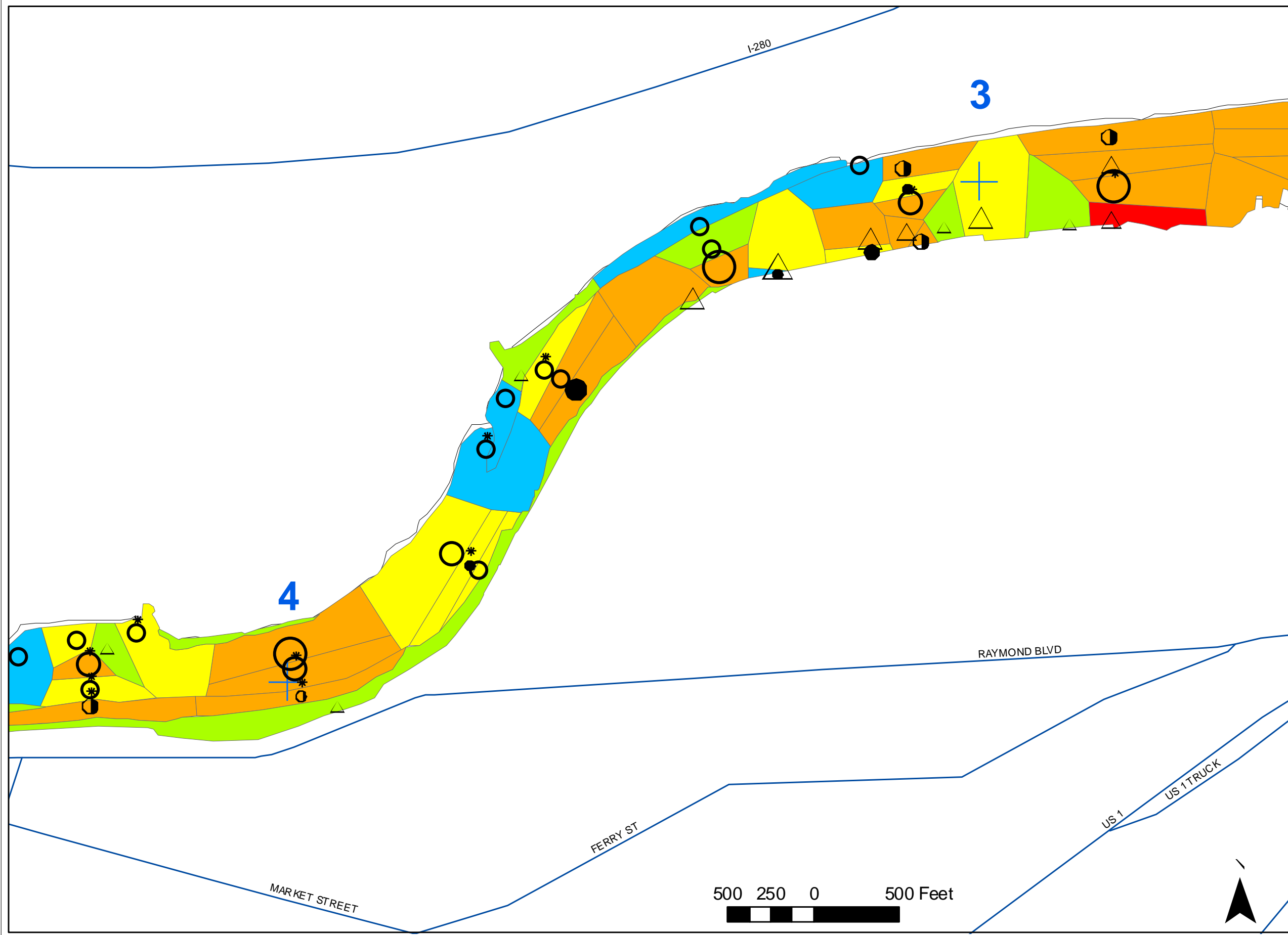
Sum of Aroclors 1248, 1254 and 1260 Mass Per Unit Area - Mile 2 to 3

Lower Passaic River Restoration Project

Figure 16-4b  
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Map Document: P:\0285924\Mapping\C SM\_MassBalance\PCBSum\_Thiessen\_RM3\_4.mxd



**Legend**

**Mass Per Unit Area (g/m<sup>2</sup>)**  

	< 0.32
	0.32 - 1.0
	1.0 - 3.2
	3.2 - 10
	10 - 36

**Core Type**  
**Continuous**  

	< 125 ng/g at core bottom
	≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
	≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

  
**Interpolated<sup>1</sup>**  

	< 125 ng/g at core bottom
	≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
	≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (ft)**  

		0 - 5
		5 - 10
		10 - 15
		15 - 20

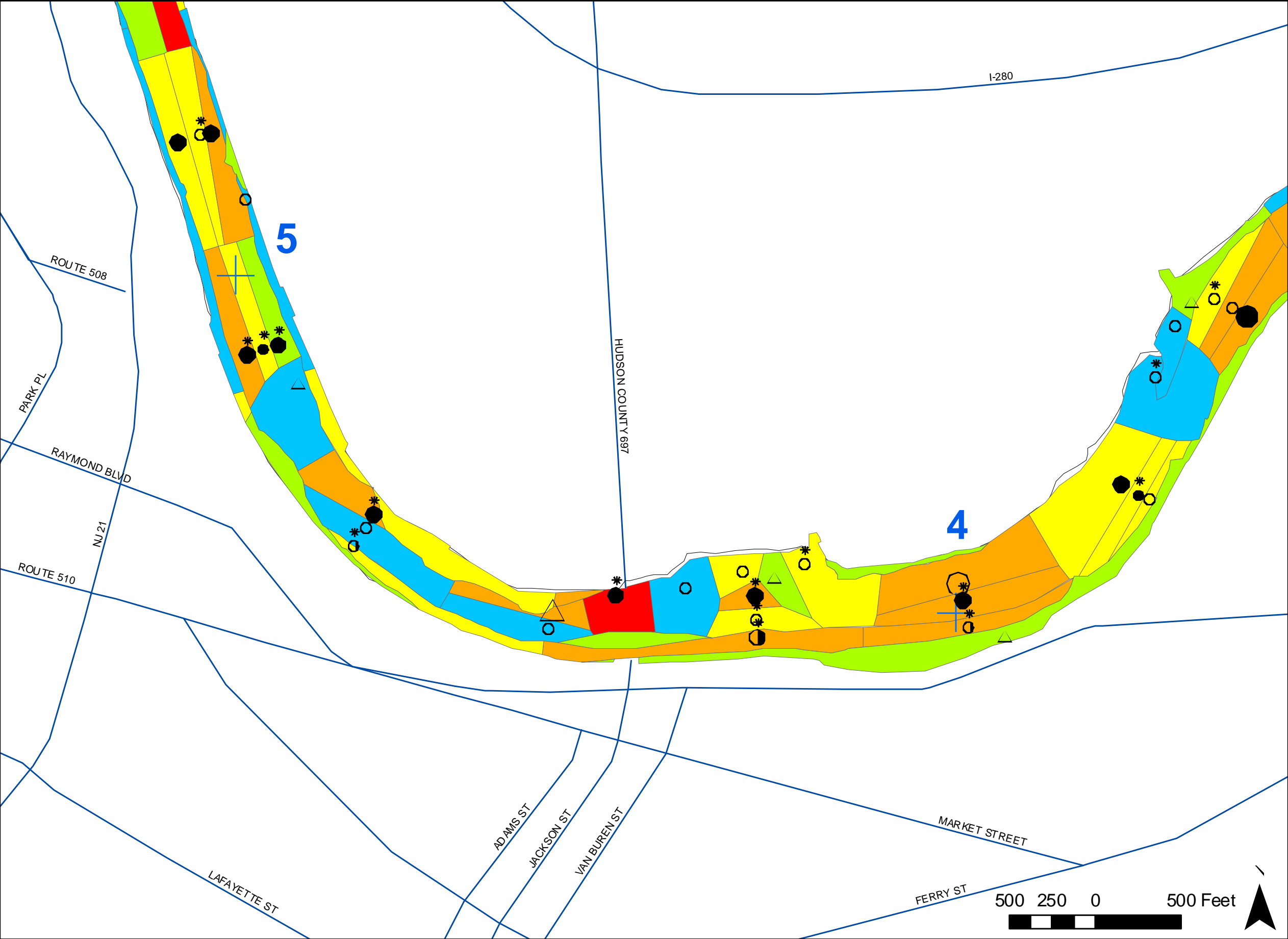
**Rejected Measurement(s) Present in Core**  
 **River Mile Marker**  
 1

Notes:  
<sup>a</sup> MPA scale was combined since only 1 data point is higher than 32 g/m<sup>2</sup>.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.  
<sup>c</sup> Rejected measurement present in one or more segments for one or more analytes. Rejected values were replaced with an interpolated value based on adjoining segments in the core.



Sum of Aroclors 1248, 1254 and 1260 Mass Per Unit Area - Mile 3 to 4

Map Document: P:\02 85924\Mapping\CSM\_MassBalance\PCBSum\_Thiessen\_RM 4\_5.mxd



**Legend**

**Mass Per Unit Area (g/m<sup>2</sup>)**  

< 0.32

0.32- 1.0

1.0 - 3.2

3.2 - 10

10 - 36

**Core Type**  
Continuous  

< 125 ng/g at core bottom

≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc

≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

  
Interpolated<sup>1</sup>  

< 125 ng/g at core bottom

≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc

≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (ft)**  

0 - 5

5 - 10

10 - 15

15 - 20

**Rejected Measurement(s) Present in Core**  

\*

**River Mile Marker**  

+ 1

Notes:

<sup>a</sup>MPA scale was combined since only 1 data point is higher than 32 g/m<sup>2</sup>.

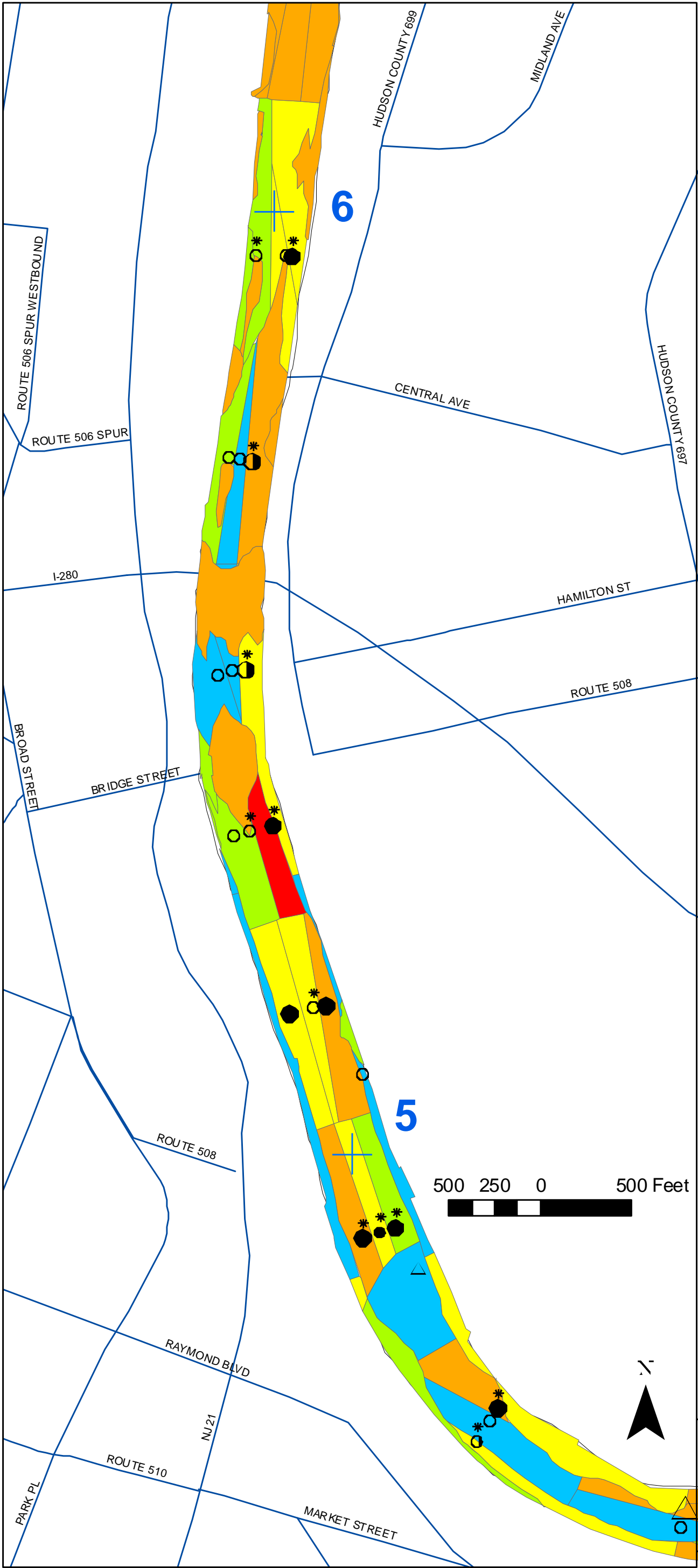
<sup>b</sup>Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup>Rejected measurement present in one or more segments for one or more analytes. Rejected values were replaced with an interpolated value based on adjoining segments in the core.



Sum of Aroclors 1248, 1254 and 1260 Mass Per Unit Area - Mile 4 to 5

P:\028592 4\Mapping\CSM\_MassBalance\PCBSum\_Thiessen\_RM5\_6.mxd



## Legend

### Mass Per Unit Area (g/m<sup>2</sup>)

- < 0.32
- 0.32- 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 36<sup>a</sup>

### Core Type

#### Continuous

- < 125 ng/g at core bottom
- ≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Interpolated<sup>b</sup>

- < 125 ng/g at core bottom
- ≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

### Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ● | 5 - 10  |
| △ | ○ | 10 - 15 |
| △ | ○ | 15 - 20 |

### Rejected Measurement(s) Present in Core<sup>c</sup>

\*

### River Mile Marker

+ 1

Notes:  
<sup>a</sup> MPA scale was combined since only 1 data point is higher than 32 g/m<sup>2</sup>.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.  
<sup>c</sup> Rejected measurement present in one or more segments for one or more analytes. Rejected values were replaced with an interpolated value based on adjoining segments in the core.

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Sum of Aroclors 1248, 1254 and 1260  
Mass Per Unit Area - Mile 5 to 6

Figure 16-4e  
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Lower Passaic River Restoration Project



Legend

Mass Per Unit Area (g/m<sup>2</sup>)

- < 0.32
- 0.32- 1.0
- 1.0 - 3.2
- 3.2 - 10
- 10 - 36<sup>a</sup>

Core Type

Continuous

- < 125 ng/g at core bottom
- ≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

- < 125 ng/g at core bottom
- ≥ 125 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 125 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ● | 5 - 10  |
| △ | ⊖ | 10 - 15 |
| △ | ◯ | 15 - 20 |

Rejected Measurement(s) Present in Core<sup>c</sup>

\*

River Mile Marker

+ 1

Notes:  
<sup>a</sup> MPA scale was combined since only 1 data point is higher than 32 g/m<sup>2</sup>.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.  
<sup>c</sup> Rejected measurement present in one or more segments for one or more analytes. Rejected values were replaced with an interpolated value based on adjoining segments in the core.

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Sum of Aroclors 1248, 1254 and 1260  
Mass Per Unit Area - Mile 6 to 7

Figure 16-4f  
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Lower Passaic River Restoration Project



### Legend

#### Mass Per Unit Area<sup>a</sup> (g/m<sup>2</sup>)

[Dark Blue]	< 1
[Light Blue]	0.32 - 1
[Green]	1 - 3.2
[Yellow]	3.2 - 10
[Orange]	10 - 32
[Red]	32 - 64

#### Core Type

##### Continuous

- < 200 ng/g at core bottom
- ◐ ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

##### Interpolated<sup>b</sup>

- △ < 200 ng/g at core bottom
- ◐ ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ▲ ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Depth (feet)

△	○	0 - 5
△	○	5 - 10
△	○	10 - 15
△	○	15 - 20

#### Rejected Measurement(s) Present in Core<sup>c</sup>

\*

#### River Mile Marker

+ 1

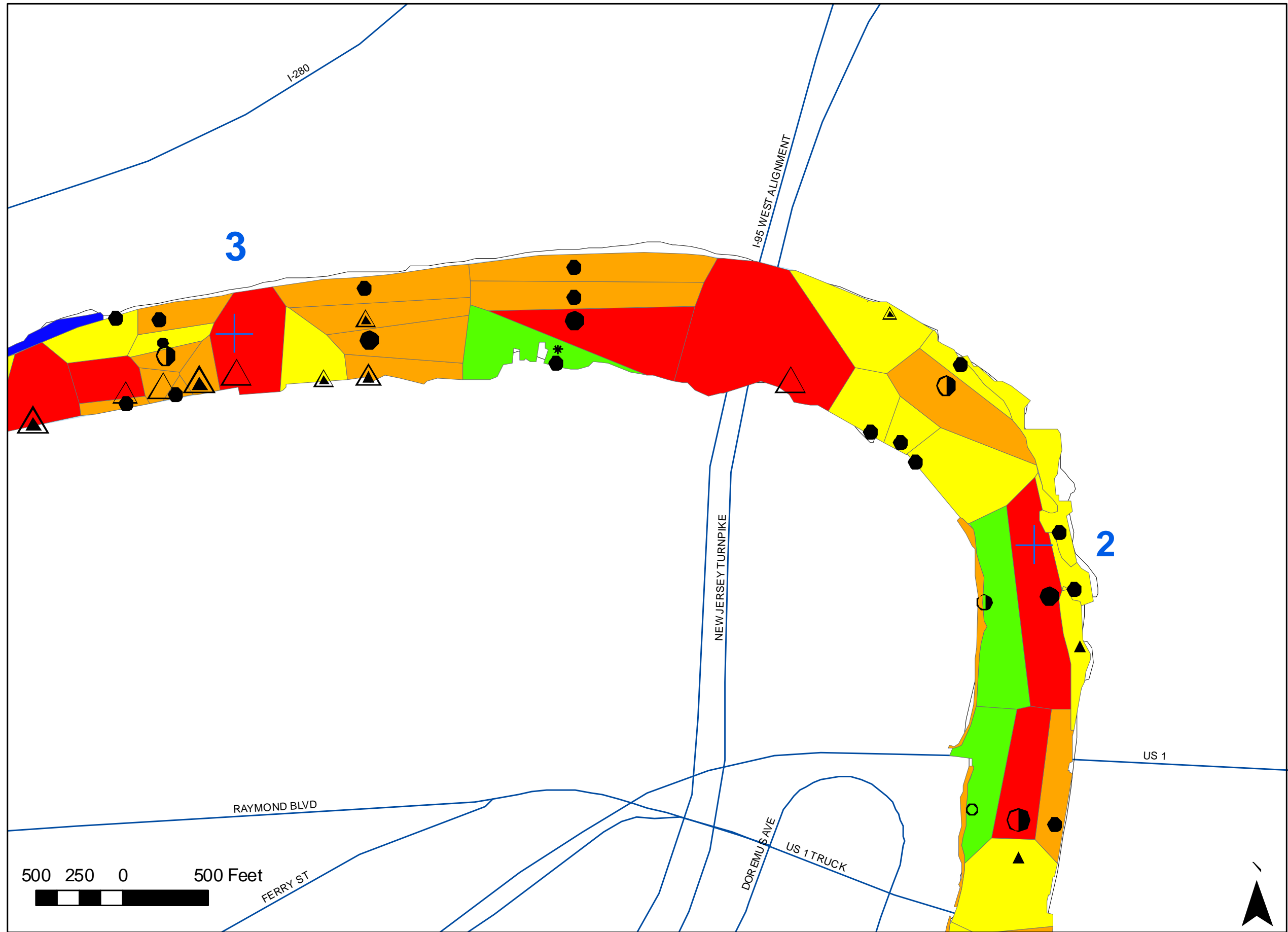
Notes:

<sup>a</sup> Mercury background for a 20-foot silt core is less than 0.24 g/m<sup>2</sup>. Mercury background for a 6-foot silt core is less than 0.07 g/m<sup>2</sup>.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.

Map Docu ment:P:\02 85924\Maping\CSM\_ MassBalance\Hg\_ Thiessen\_ RM2\_ 3.mxd



### Legend

#### Mass Per Unit Area<sup>a</sup> (g/m<sup>2</sup>)

- < 1
- 0.32 - 1
- 1 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 64

#### Core Type

##### Continuous

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

##### Interpolated<sup>b</sup>

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ○ | 5 - 10  |
| △ | ○ | 10 - 15 |
| △ | ○ | 15 - 20 |

#### Rejected Measurement(s) Present in Core<sup>c</sup>

\*

#### River Mile Marker

+ 1

Notes:  
<sup>a</sup> Mercury background for a 20-foot silt core is less than 0.24 g/m<sup>2</sup>. Mercury background for a 6-foot silt core is less than 0.07 g/m<sup>2</sup>.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.  
<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.



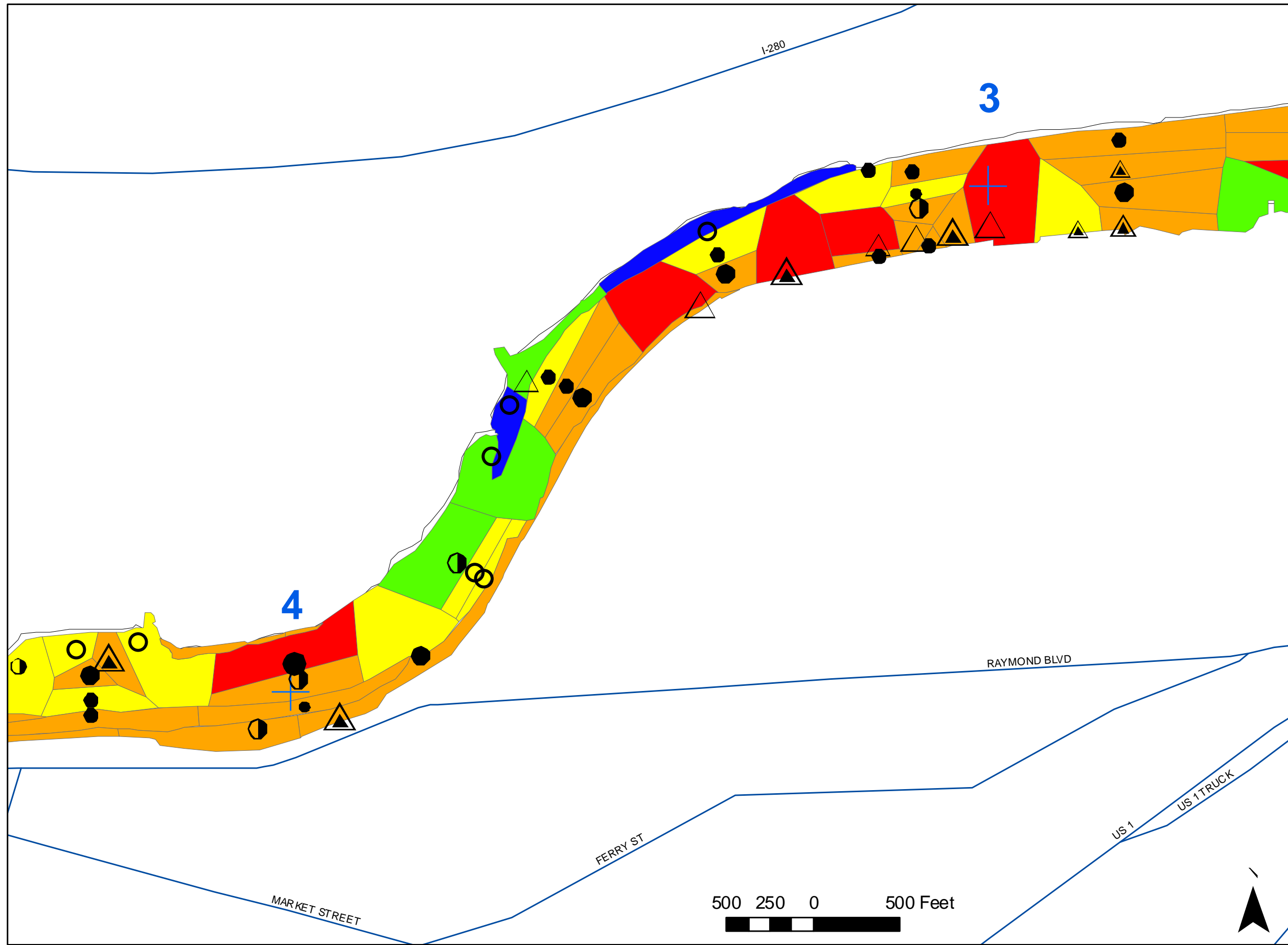
Mercury Mass Per Unit Area - Mile 2 to 3

Lower Passaic River Restoration Project

Figure 16-5b  
Page 2 of 6

2009

Map Document: P:\0285924\Mapping\CSM\_MassBalance\Hg\_Thiessen\_RM3\_4.mxd



## Legend

### Mass Per Unit Area<sup>a</sup> (g/m<sup>2</sup>)

- < 1
- 0.32 - 1
- 1 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 64

### Core Type

#### Continuous

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Interpolated<sup>b</sup>

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

### Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ○ | 5 - 10  |
| △ | ○ | 10 - 15 |
| △ | ○ | 15 - 20 |

### Rejected Measurement(s) Present in Core<sup>c</sup>

\*

### River Mile Marker

+ 1

#### Notes:

<sup>a</sup> Mercury background for a 20-foot silt core is less than 0.24 g/m<sup>2</sup>.

Mercury background for a 6-foot silt core is less than 0.07 g/m<sup>2</sup>.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.

Mercury Mass Per Unit Area - Mile 3 to 4

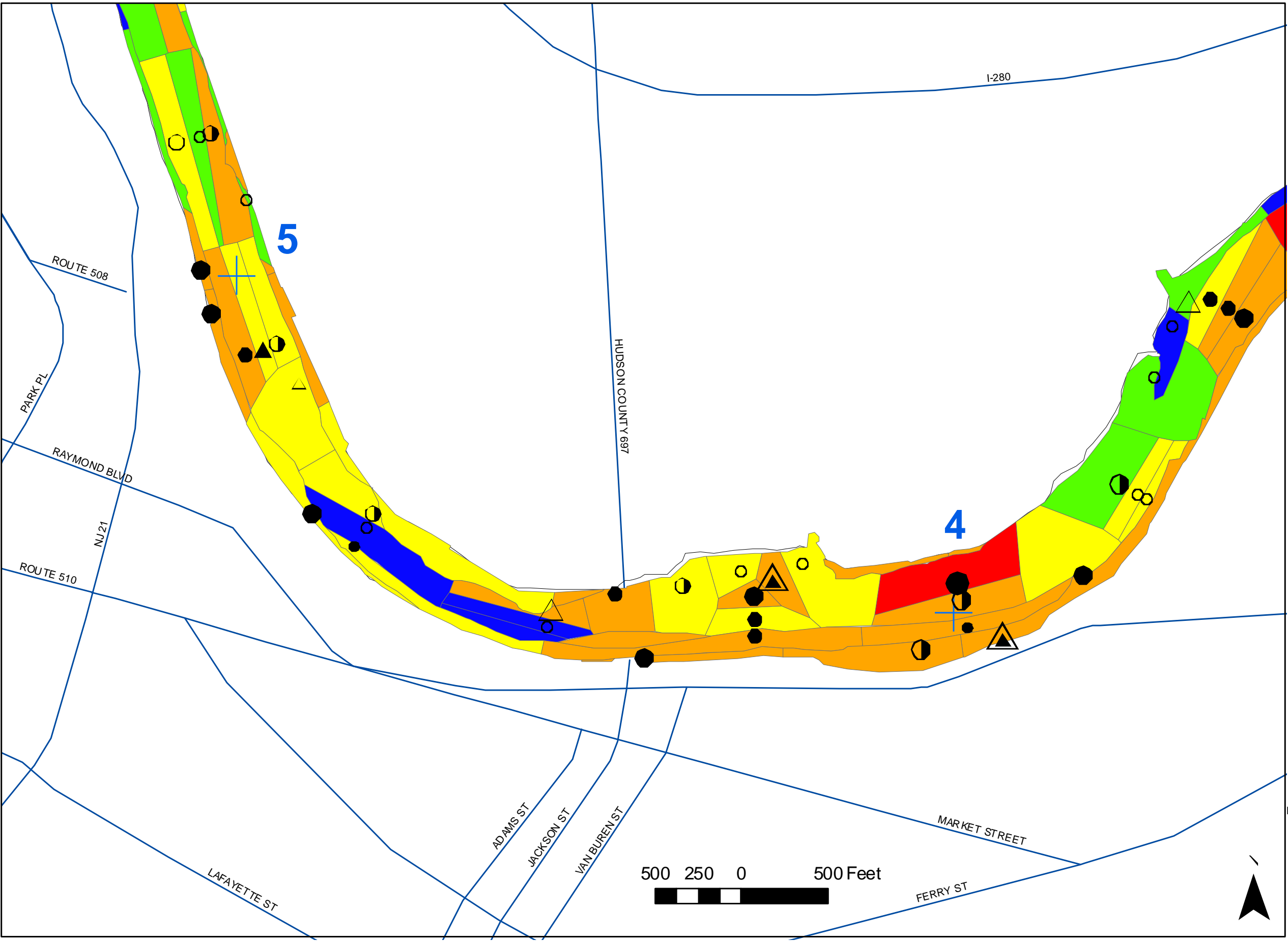
Lower Passaic River Restoration Project

Figure 16-5c  
Page 3 of 6

2009



Map Document:P:\0285924\Mapping\CSM\_MassBalance\Hg\_Thiessen\_RM4\_5.mxd



### Legend

**Mass Per Unit Area<sup>a</sup> (g/m<sup>2</sup>)**

- < 1
- 0.32 - 1
- 1 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 64

**Core Type**

Continuous

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

**Depth (feet)**

△	○	0 - 5
△	○	5 - 10
△	○	10 - 15
△	○	15 - 20

**Rejected Measurement(s) Present in Core<sup>c</sup>**

\*

**River Mile Marker**

+ 1

Notes:

<sup>a</sup> Mercury background for a 20-foot silt core is less than 0.24 g/m<sup>2</sup>. Mercury background for a 6-foot silt core is less than 0.07 g/m<sup>2</sup>.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.



Mercury Mass Per Unit Area - Mile 4 to 5

Lower Passaic River Restoration Project

Map Document:P:\02 85924\Mapping\CSM\_MassBalance\Hg\_Thiessen\_RM5\_6.mxd



## Legend

### Mass Per Unit Area<sup>a</sup> (g/m<sup>2</sup>)

- < 1
- 0.32 - 1
- 1 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 64

### Core Type

#### Continuous

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Interpolated<sup>b</sup>

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

#### Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ○ | 5 - 10  |
| △ | ○ | 10 - 15 |
| △ | ○ | 15 - 20 |

### Rejected Measurement(s) Present in Core<sup>c</sup>

\*

### River Mile Marker

+ 1

#### Notes:

<sup>a</sup> Mercury background for a 20-foot silt core is less than 0.24 g/m<sup>2</sup>.  
Mercury background for a 6-foot silt core is less than 0.07 g/m<sup>2</sup>.

<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.

<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.

Mercury Mass Per Unit Area - Mile 2 to 3

Figure 16-5e  
Page 5 of 6

2009

Lower Passaic River Restoration Project





Legend

Mass Per Unit Area<sup>a</sup> (g/m<sup>2</sup>)

- < 1
- 0.32 - 1
- 1 - 3.2
- 3.2 - 10
- 10 - 32
- 32 - 64

Core Type

Continuous

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

Interpolated<sup>b</sup>

- < 200 ng/g at core bottom
- ≥ 200 ng/g at core bottom, Bottom Conc < 50% Max Conc
- ≥ 200 ng/g at core bottom, Bottom Conc ≥ 50% Max Conc

Depth (feet)

- |   |   |         |
|---|---|---------|
| △ | ○ | 0 - 5   |
| △ | ○ | 5 - 10  |
| △ | ○ | 10 - 15 |
| △ | ○ | 15 - 20 |

Rejected Measurement(s) Present in Core<sup>c</sup>

\*

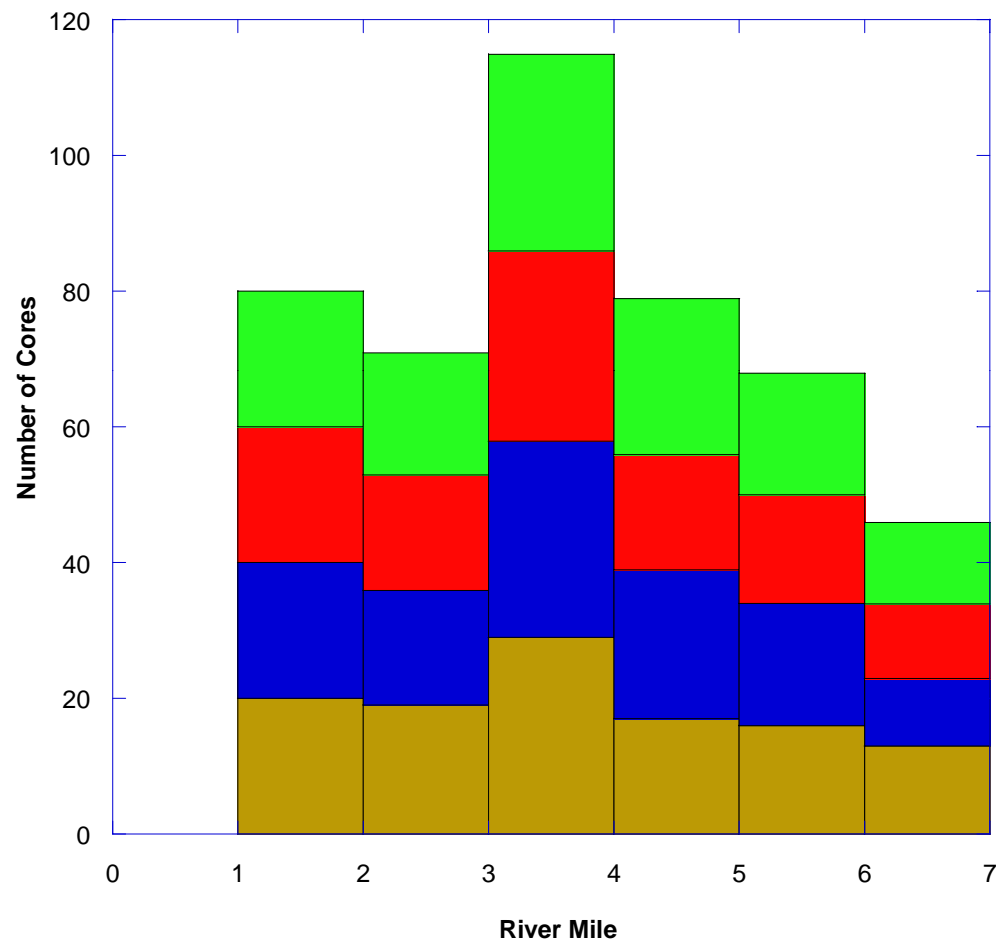
River Mile Marker

+ 1

Notes:  
<sup>a</sup> Mercury background for a 20-foot silt core is less than 0.24 g/m<sup>2</sup>. Mercury background for a 6-foot silt core is less than 0.07 g/m<sup>2</sup>.  
<sup>b</sup> Unlike a continuous core, an interpolated core was not sampled continuously throughout its length. Contaminant concentrations between measured intervals were linearly interpolated.  
<sup>c</sup> Rejected values were replaced with an interpolated value based on adjoining segments in the core.

Mercury Mass Per Unit Area - Mile 6 to 7

P:\0285924\Mapping\CSM\_MassBalance\Hg\_Thiessen\_RM6\_7.mxd



### Legend

- Total DDT
- 2,3,7,8-TCDD
- Mercury
- Total PCB

Location

### Notes

Each coring location can generate up to four MPA values, one for each contaminant.

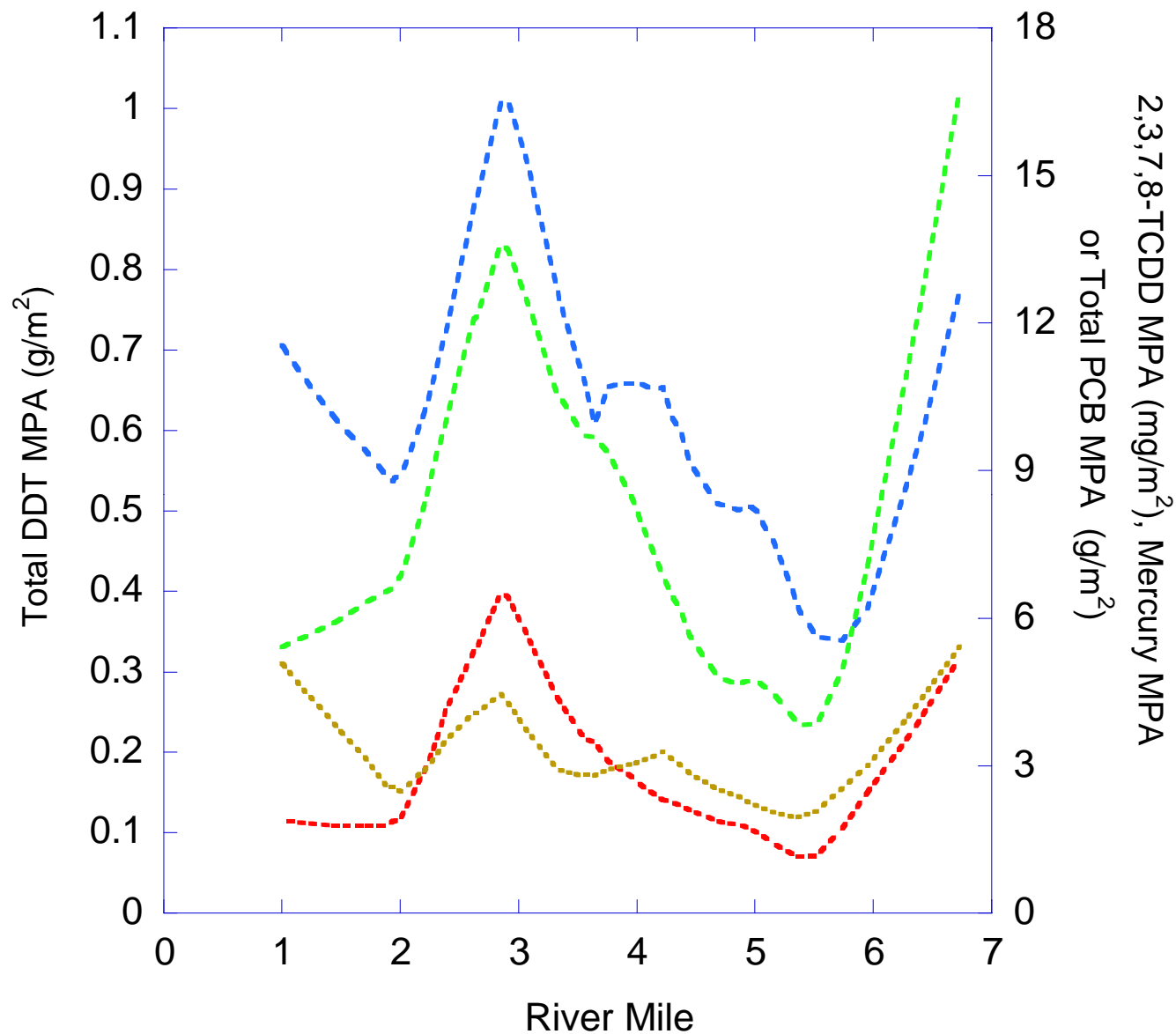


Histogram of MPA Values per River Mile

*Lower Passaic River Restoration Project*

Figure 16-6

2009



Legend

- Mercury
- 2,3,7,8-TCDD
- Total PCB
- Total DDT

Note:

MPA is mass per unit area

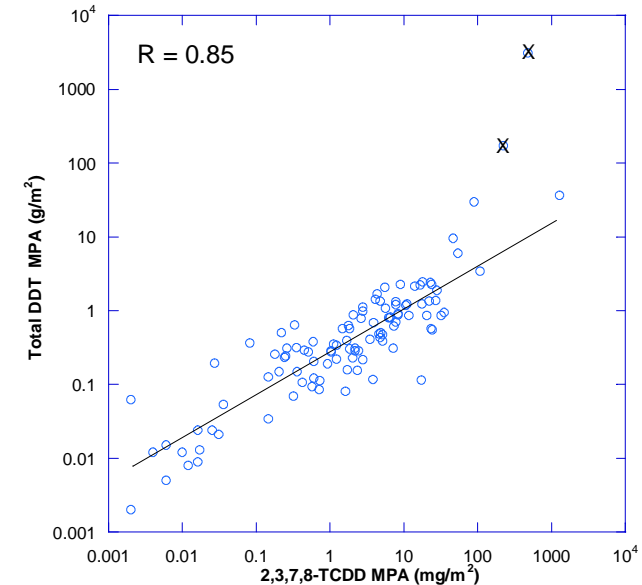
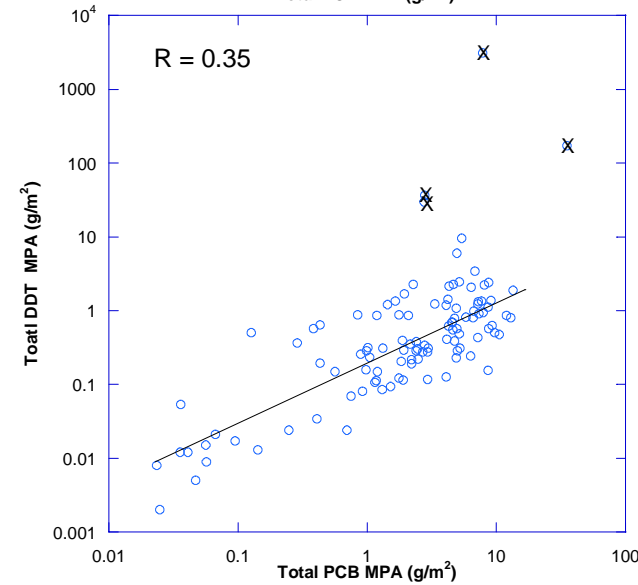
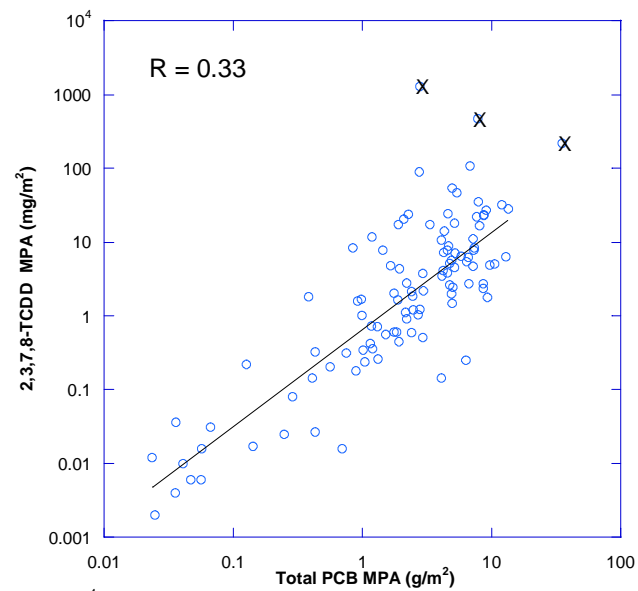
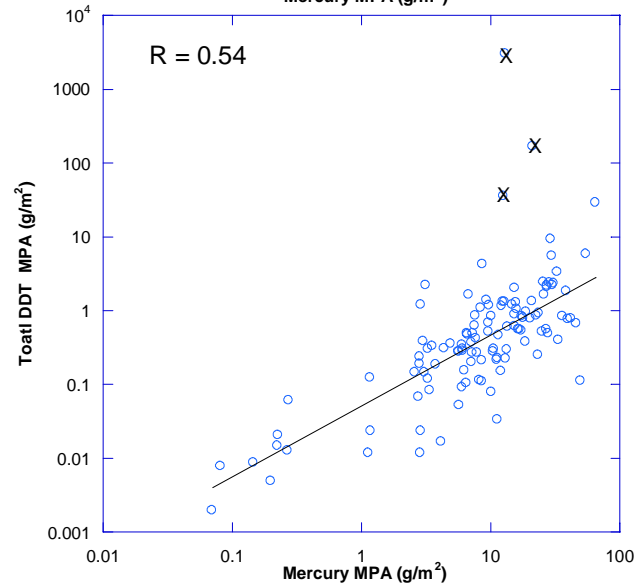
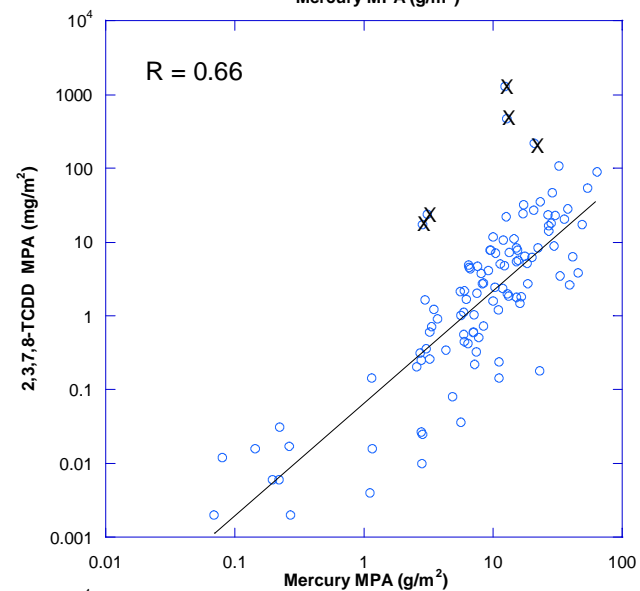
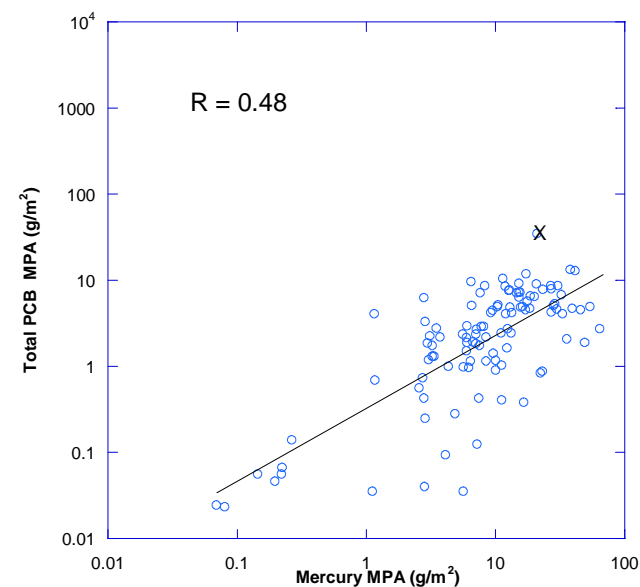


Weighted Curve Sediment Inventory versus River Mile

*Lower Passaic River Restoration Project*

Figure 16-7

2009



### Legend

- Data points
- x Points excluded from the regression
- Regression Line

### Note:

Regression Coefficient (R) is based on a linear regression of the logs of the mass per unit area (MPA) values. The MPA values are approximately log normal.

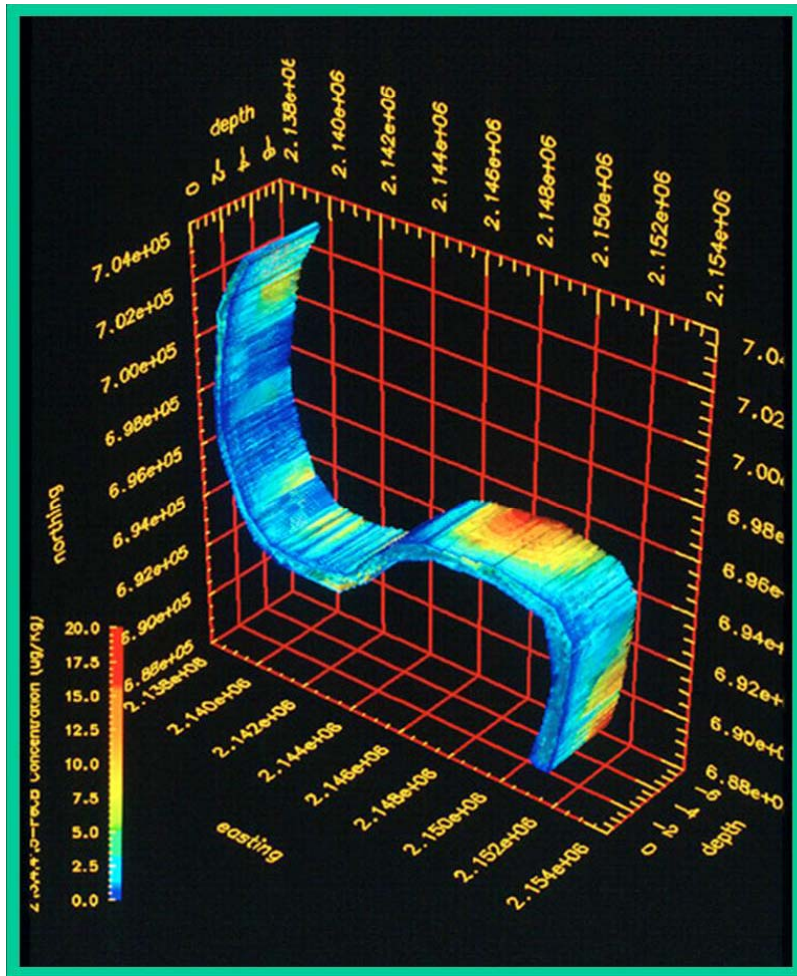


## Mass Per Unit Area Correlation Matrix

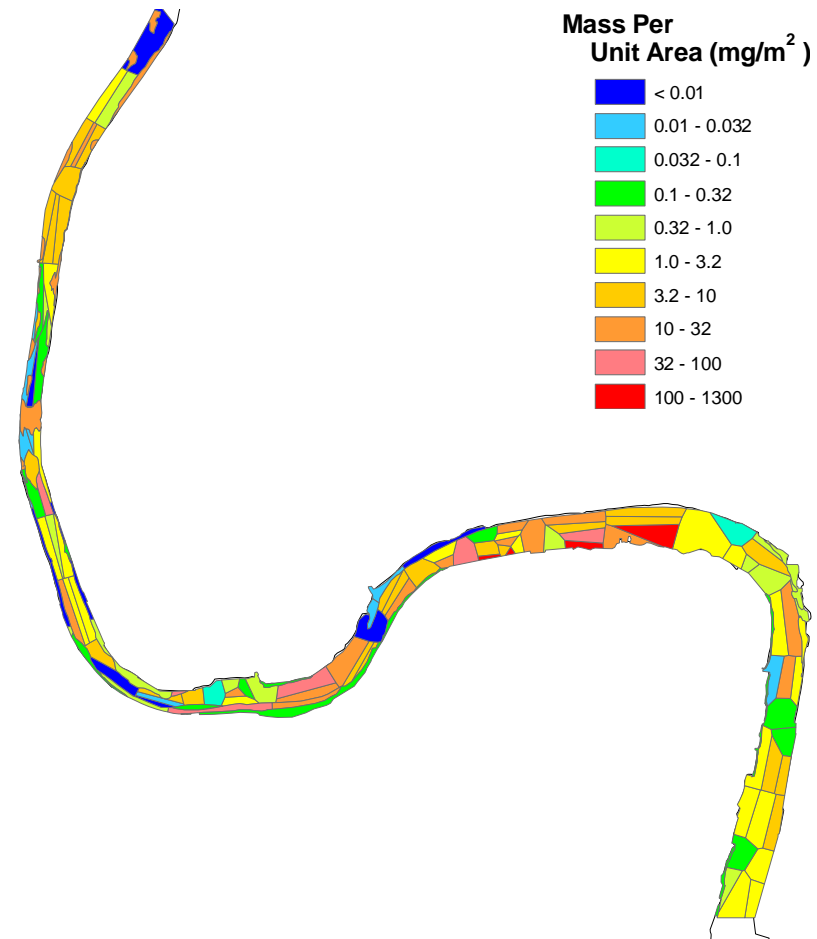
*Lower Passaic River Restoration Project*

Figure 16-8

2009



3-Dimensional Distribution taken from Ma et al. (1998)



MPA Map for 2,3,7,8-TCDD for RM 1 through 7 (Figure 5-3)

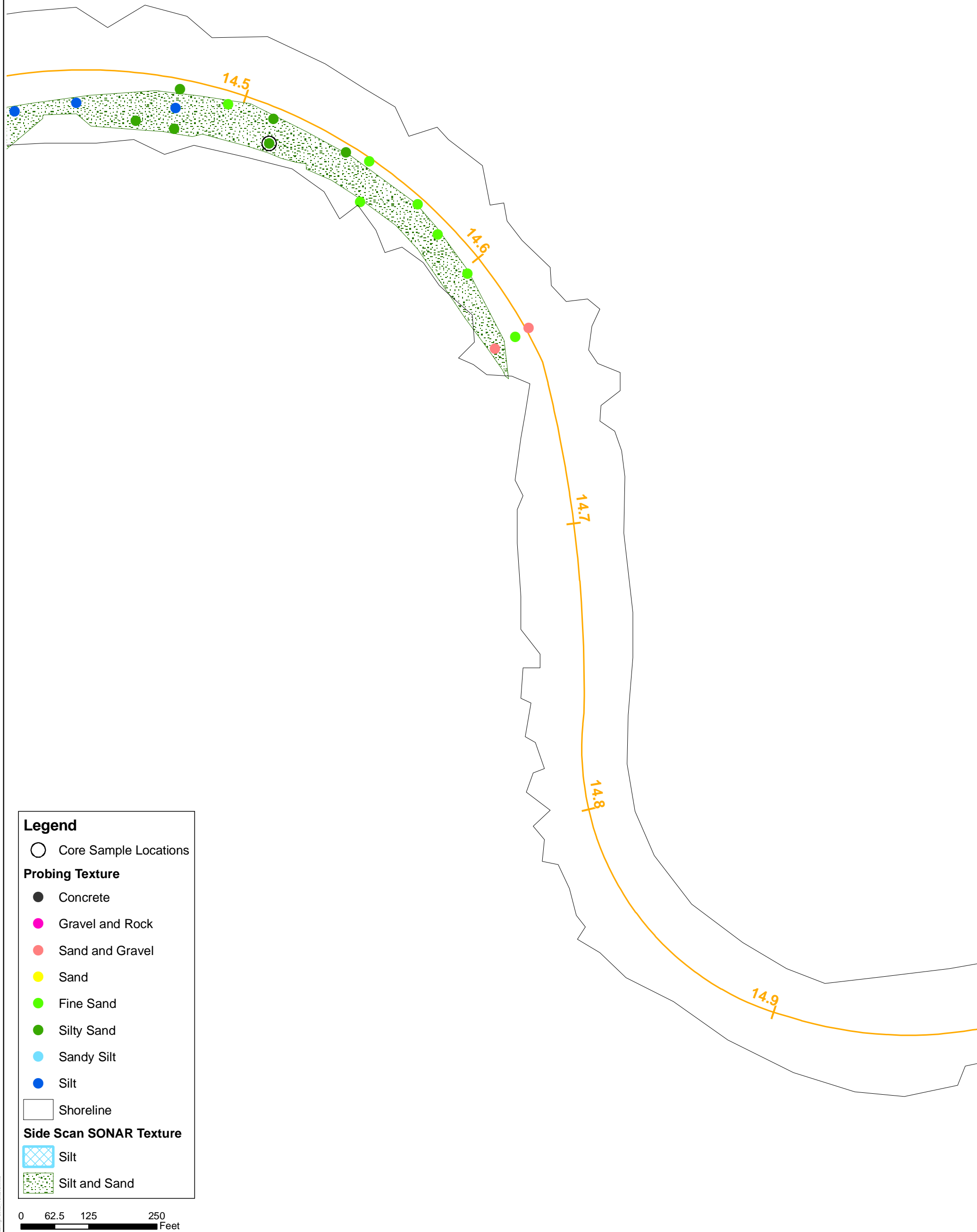


Comparison of 2,3,7,8-TCDD Spatial Extent

Lower Passaic River Restoration Project

Figure 16-9

2009



**Legend**

Core Sample Locations

**Probing Texture**

Concrete

Gravel and Rock

Sand and Gravel

Sand

Fine Sand

Silty Sand

Sandy Silt

Silt

Shoreline

**Side Scan SONAR Texture**

Silt

Silt and Sand

0 62.5 125 250  
Feet



Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10a  
2009



Sediment Texture from Probing Above RM8  
Lower Passaic River Restoration Project

Figure 16-10b

2009

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Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10c

2009

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Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

**Figure 16-10d**  
**2009**



Sediment Texture from Probing Above RM8  
Lower Passaic River Restoration Project

Figure 16-10e  
2009



**Legend**

Core Sample Locations

**Probing Texture**

Concrete

Gravel and Rock

Sand and Gravel

Sand

Fine Sand

Silty Sand

Sandy Silt

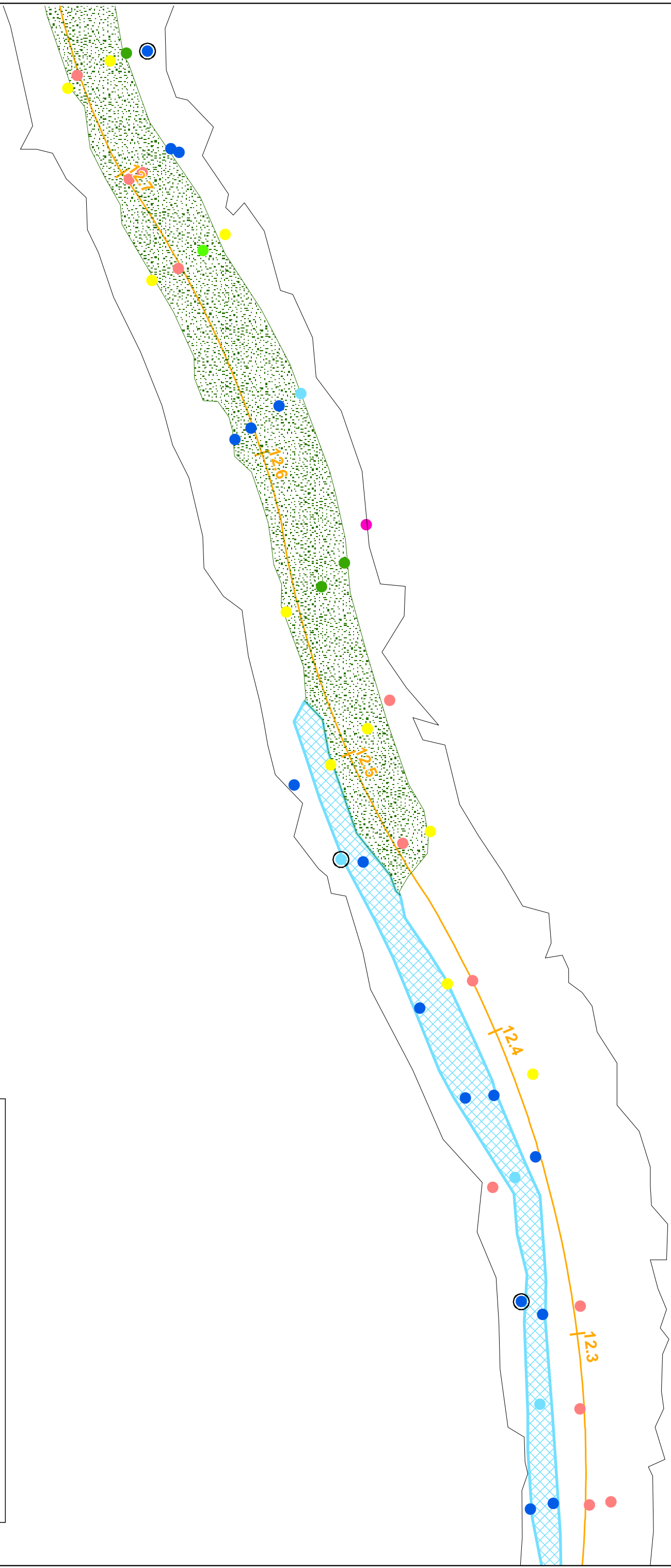
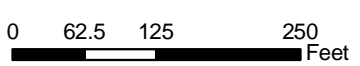
Silt

Shoreline

**Side Scan SONAR Texture**

Silt

Silt and Sand



Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10f

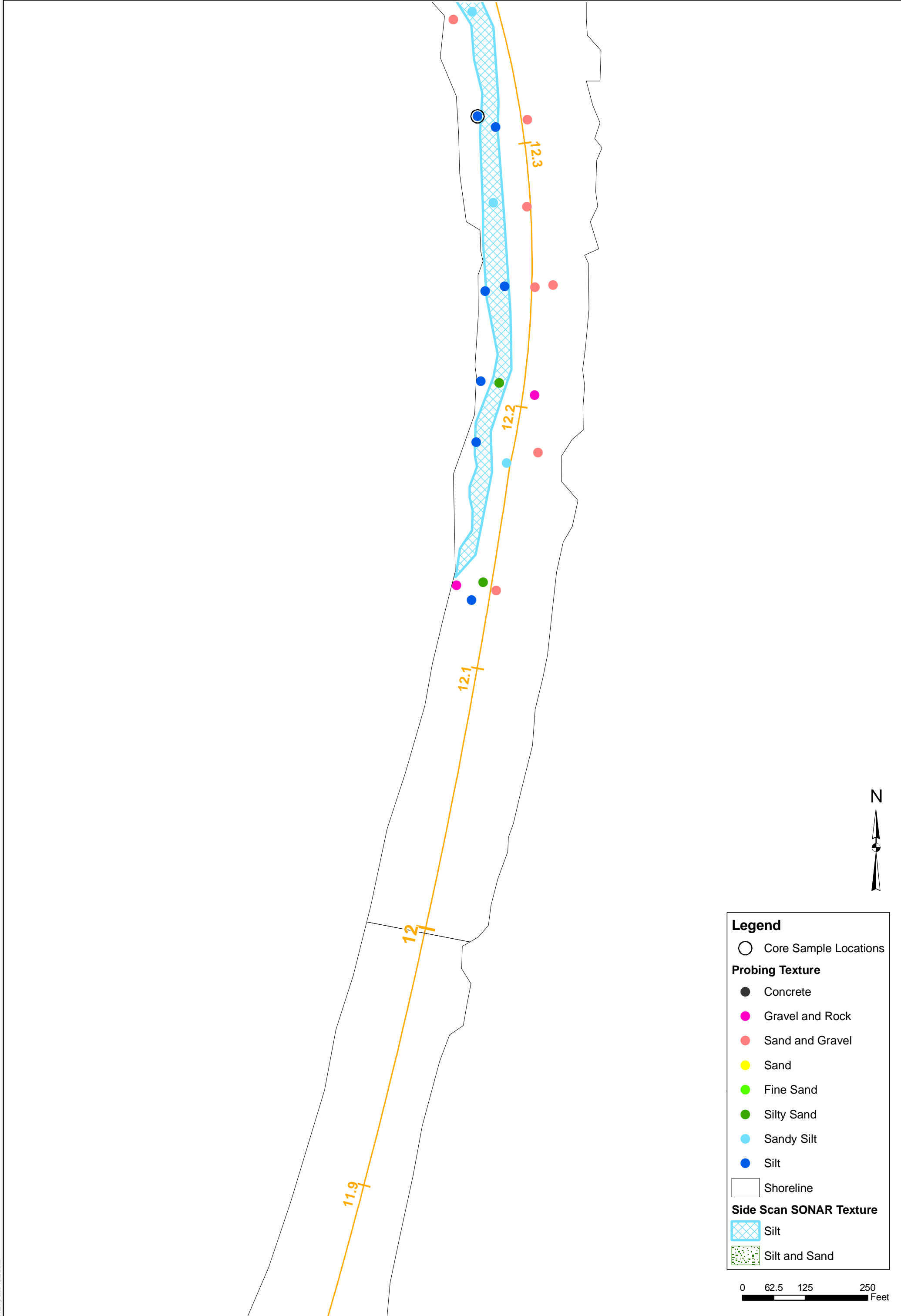
2009

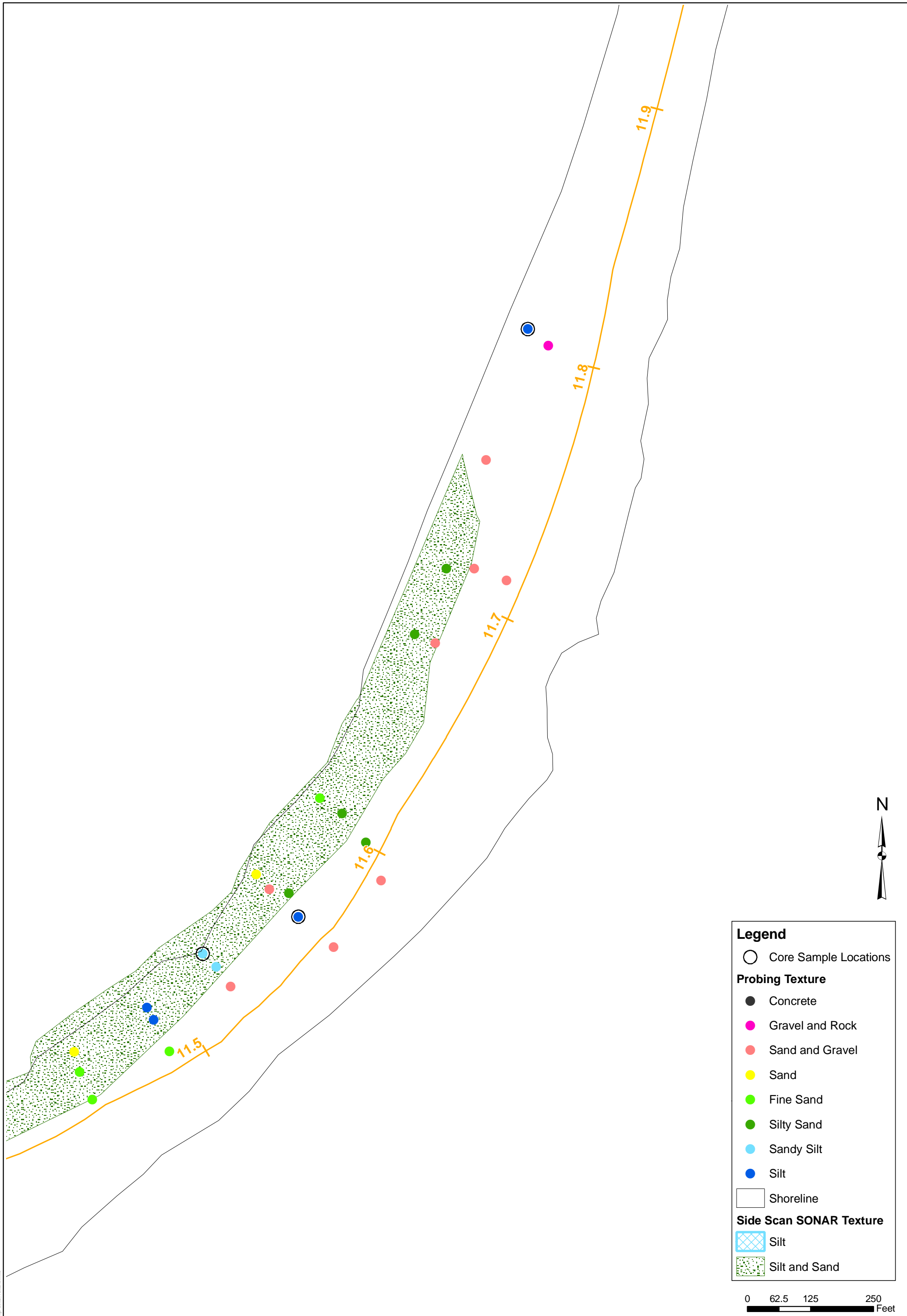
Sediment Texture from Probing Above RM8

Lower Passaic River Restoration Project

Figure 16-10g

2009



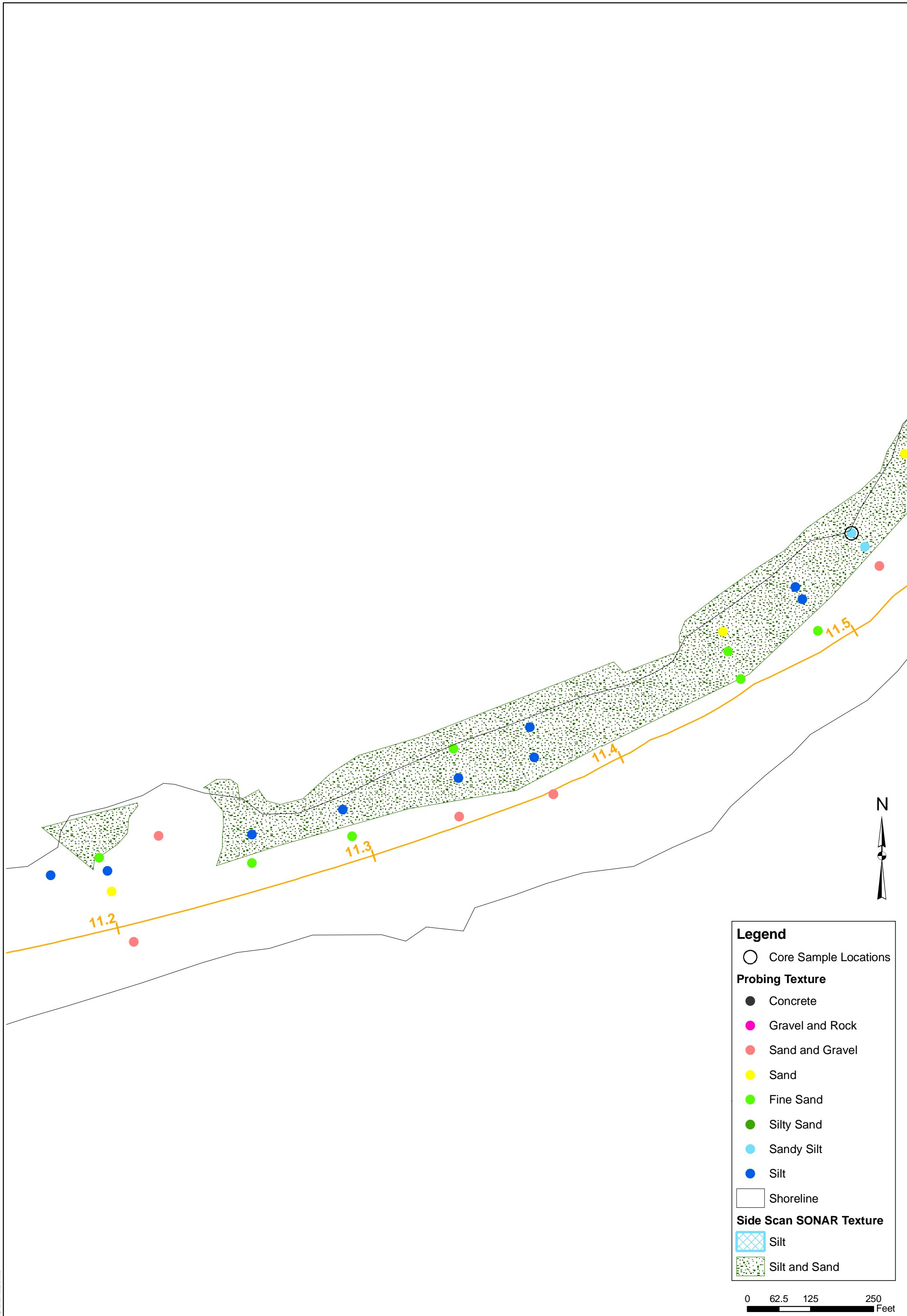


Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10h

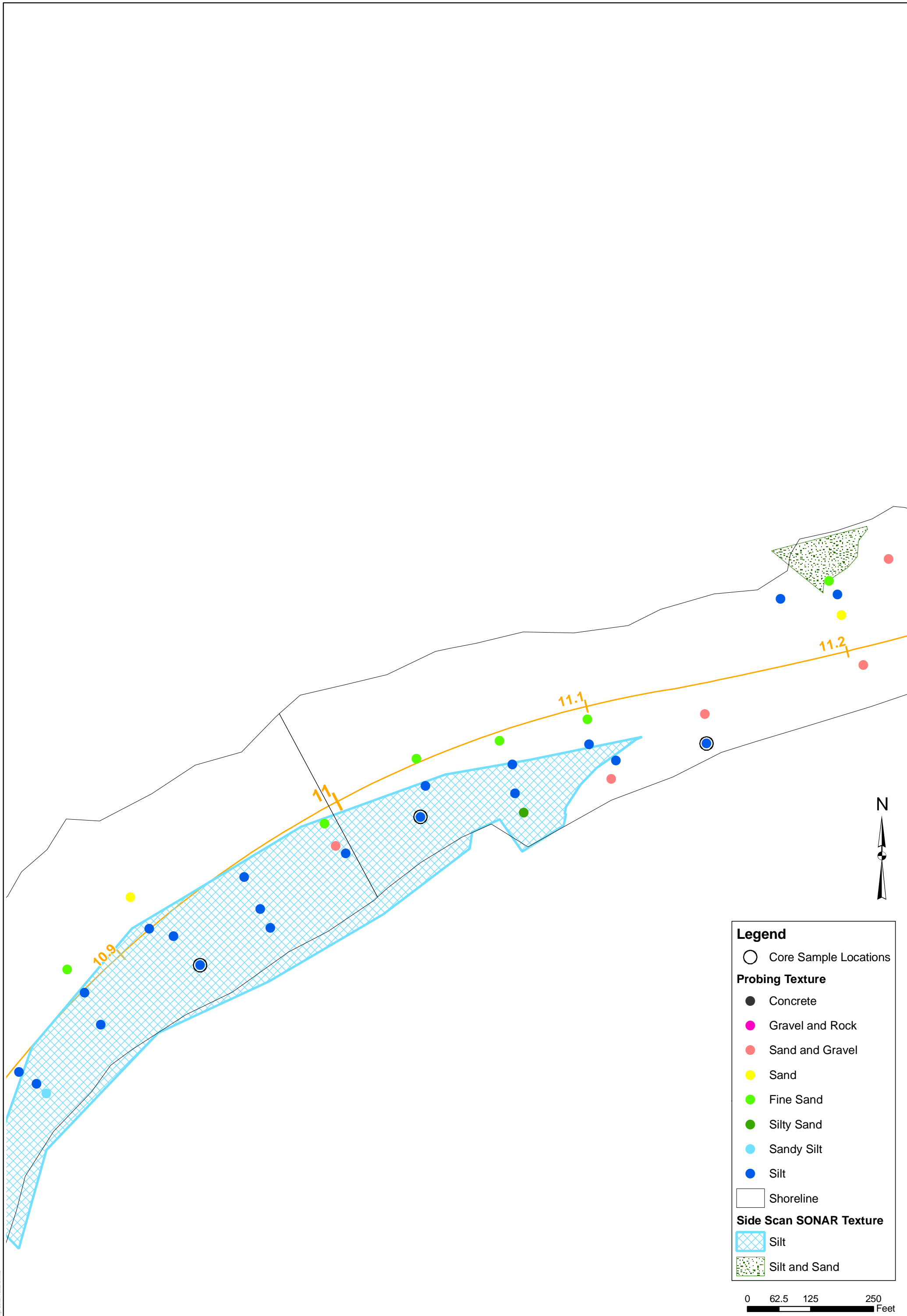
2009

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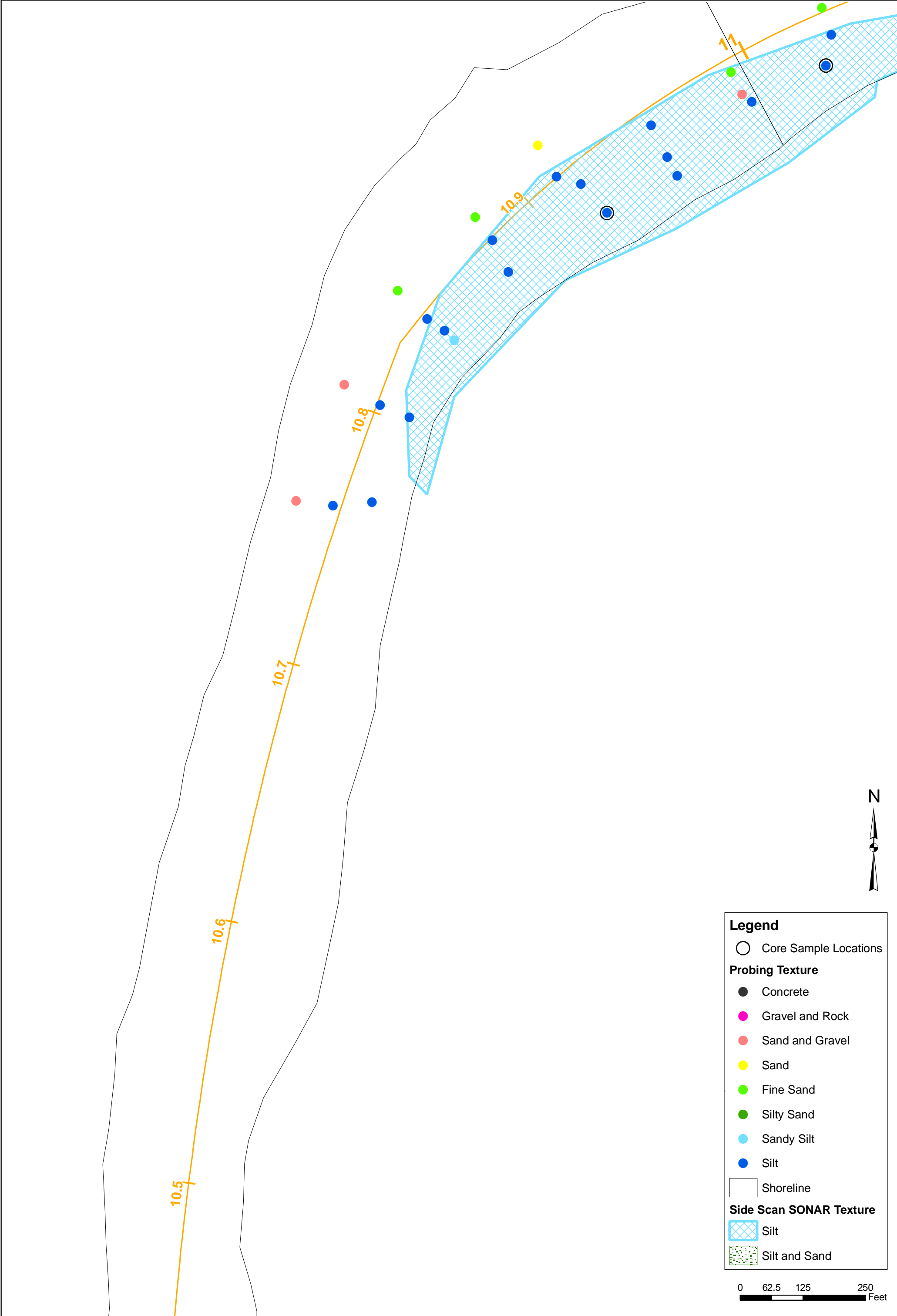
Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

**Figure 16-10i**  
**2009**



Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

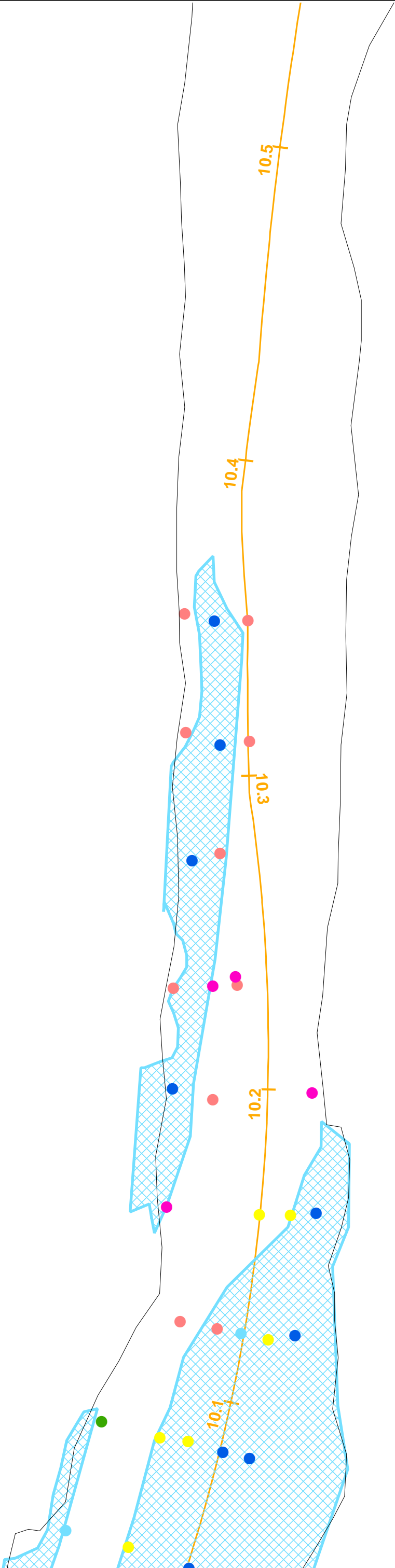
Figure 16-10j  
2009



Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10k

2009



**Legend**

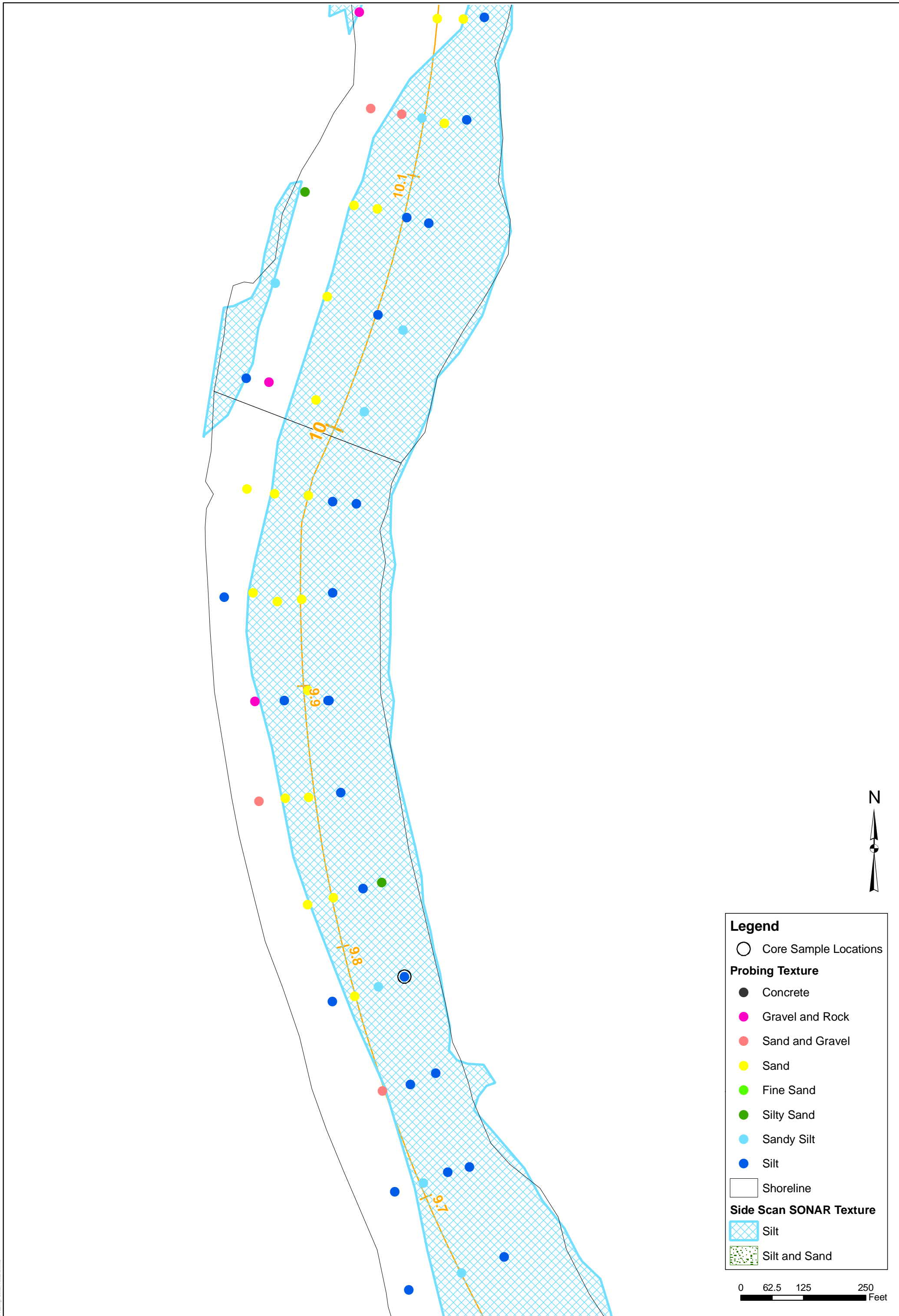
- Core Sample Locations
- Probing Texture**
  - Concrete
  - Gravel and Rock
  - Sand and Gravel
  - Sand
  - Fine Sand
  - Silty Sand
  - Sandy Silt
  - Silt
- Shoreline
- Side Scan SONAR Texture**
  - Silt
  - Silt and Sand

062.5125250

Feet

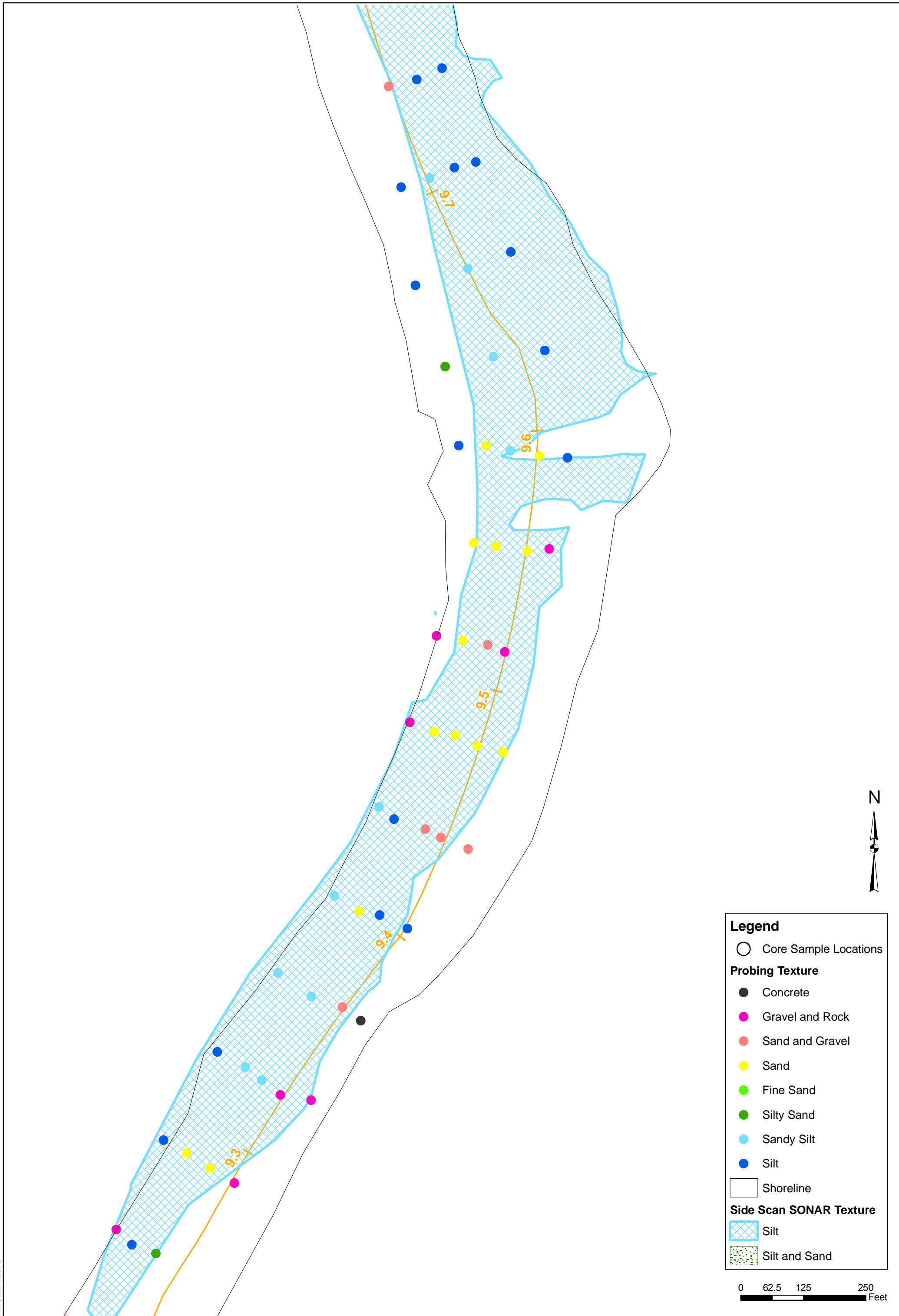
Sediment Texture from Probing Above RM8  
Lower Passaic River Restoration Project

Figure 16-10I  
2009



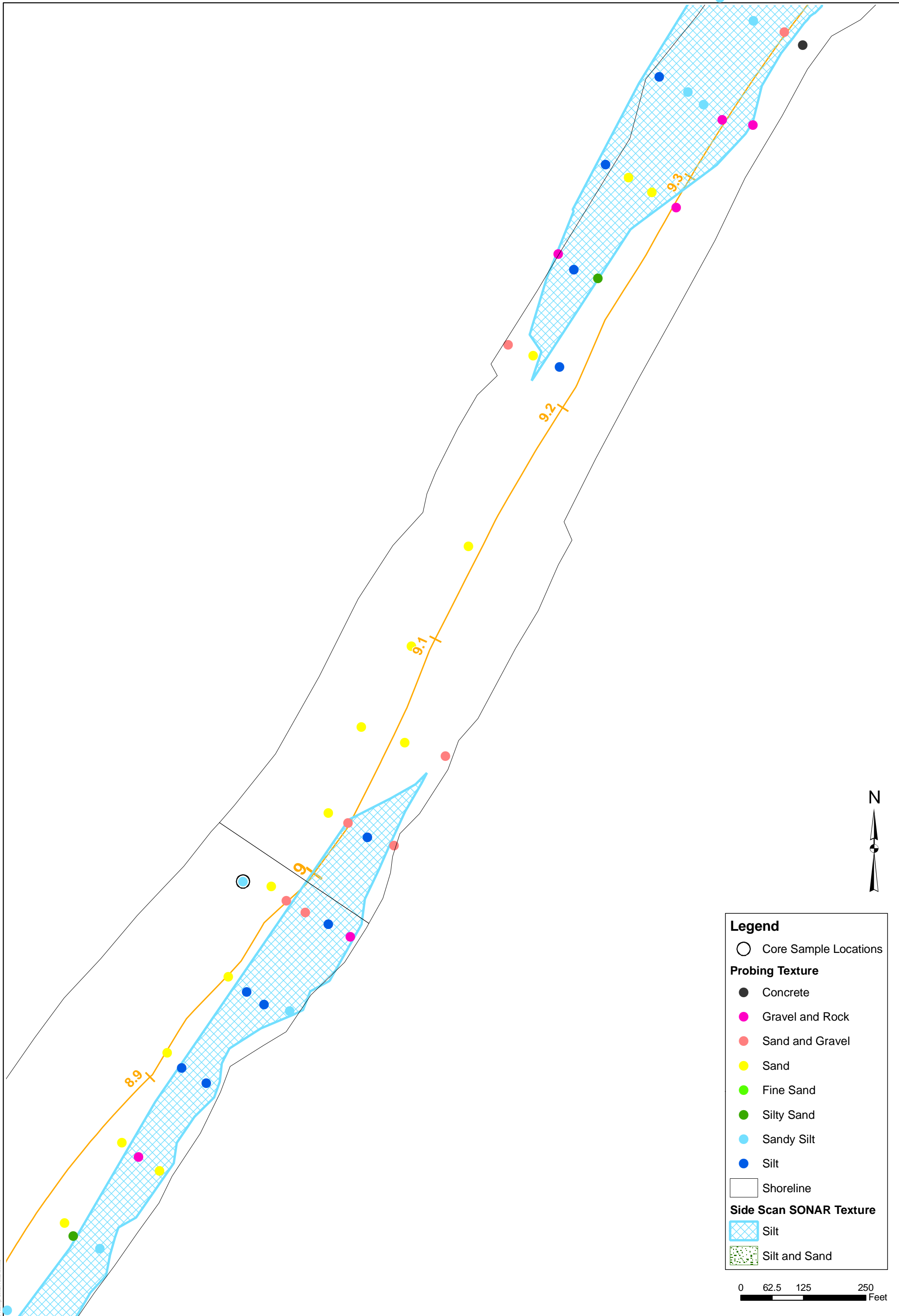
Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10m  
2009



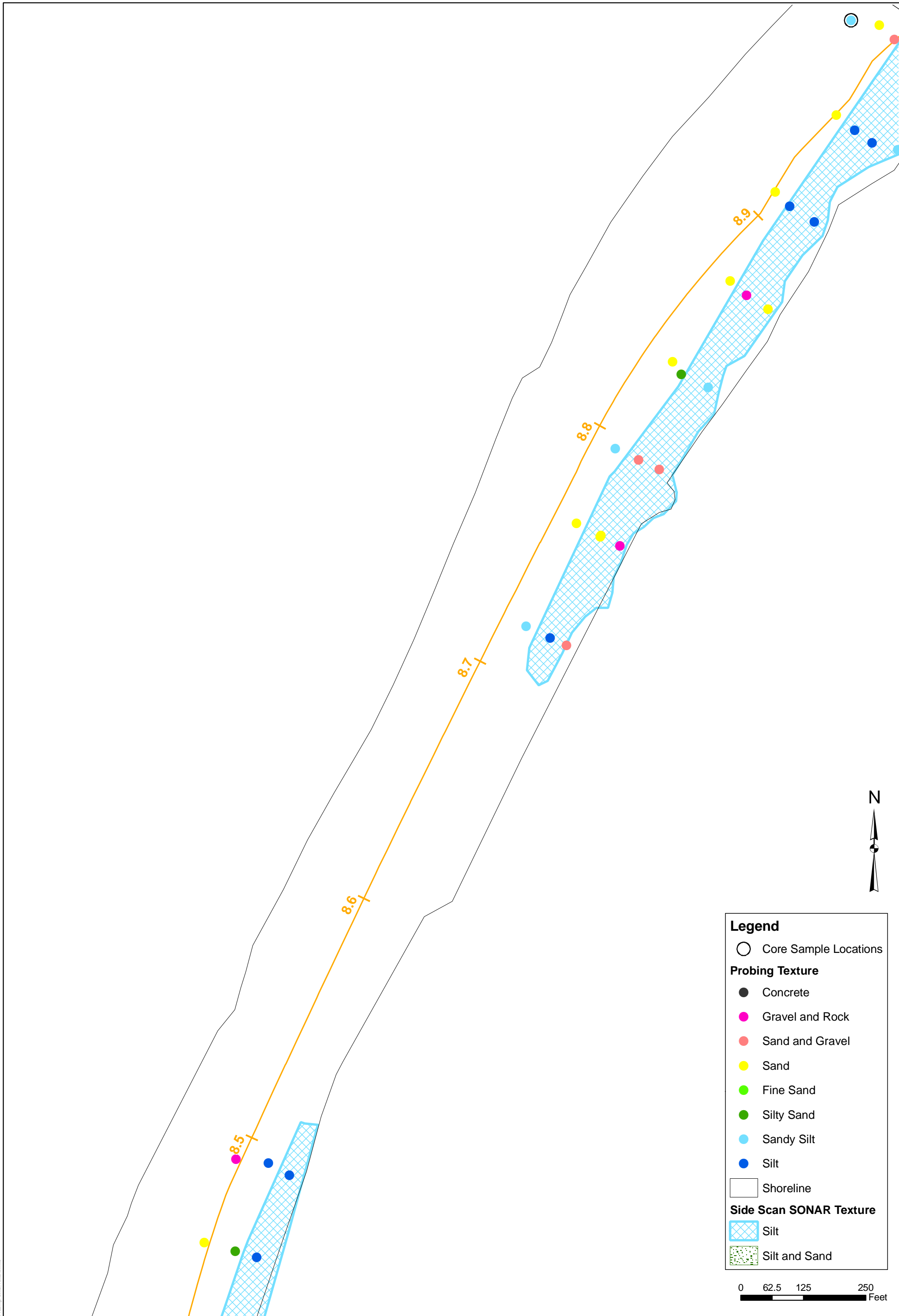
Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

**Figure 16-10n**  
**2009**



Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

**Figure 16-10o**  
**2009**

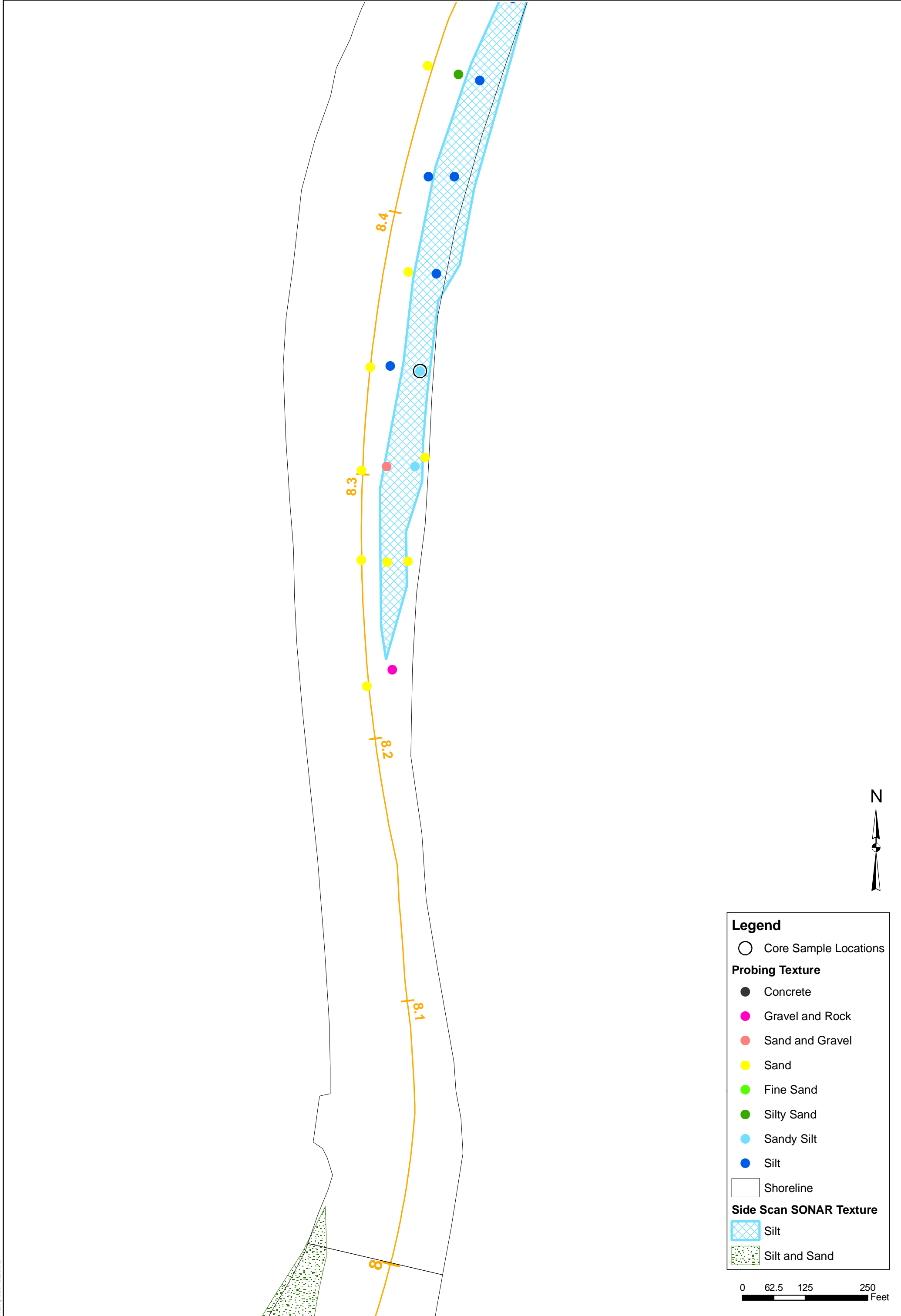


Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10p

2009

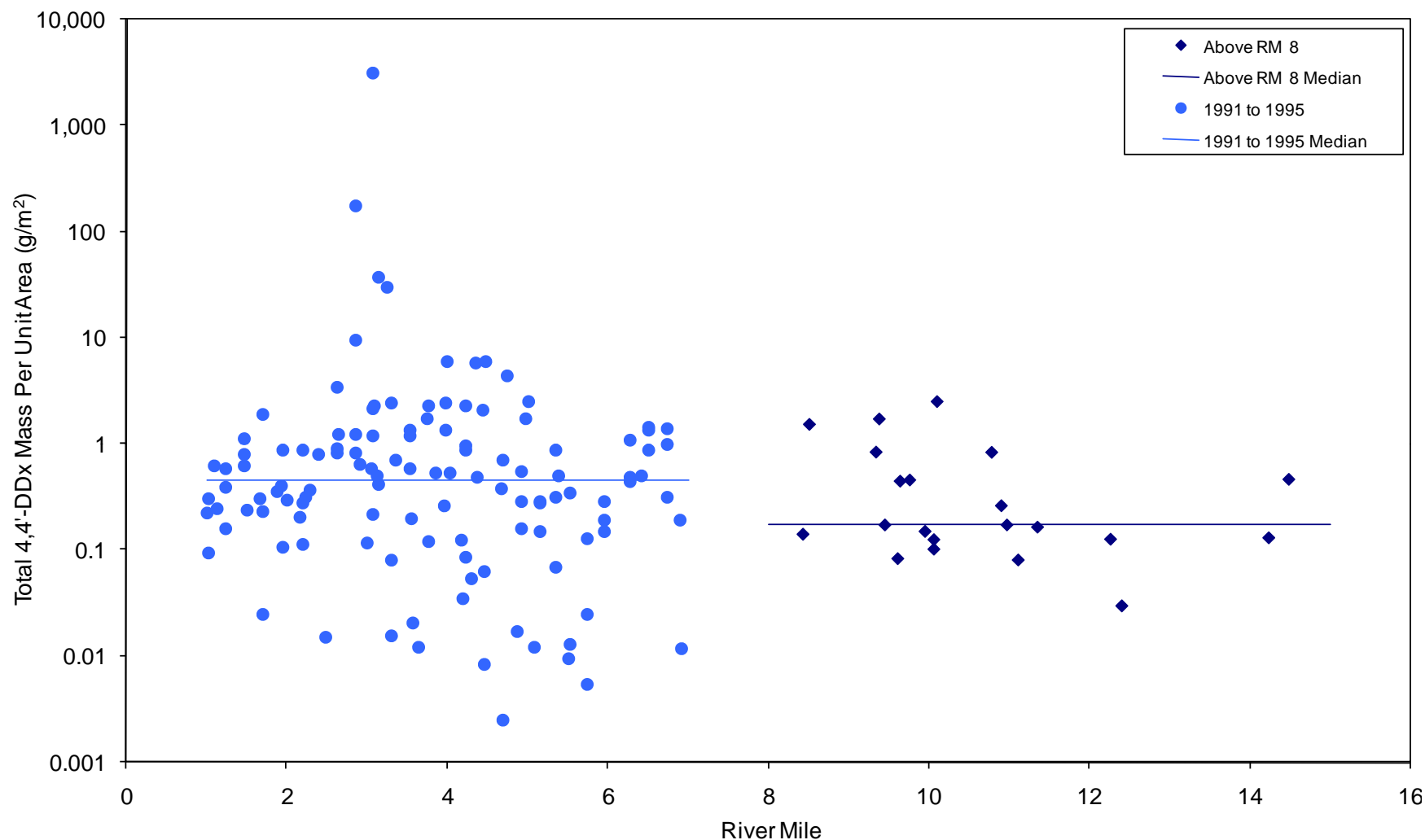
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Sediment Texture from Probing Above RM8  
*Lower Passaic River Restoration Project*

Figure 16-10q

2009



Note:

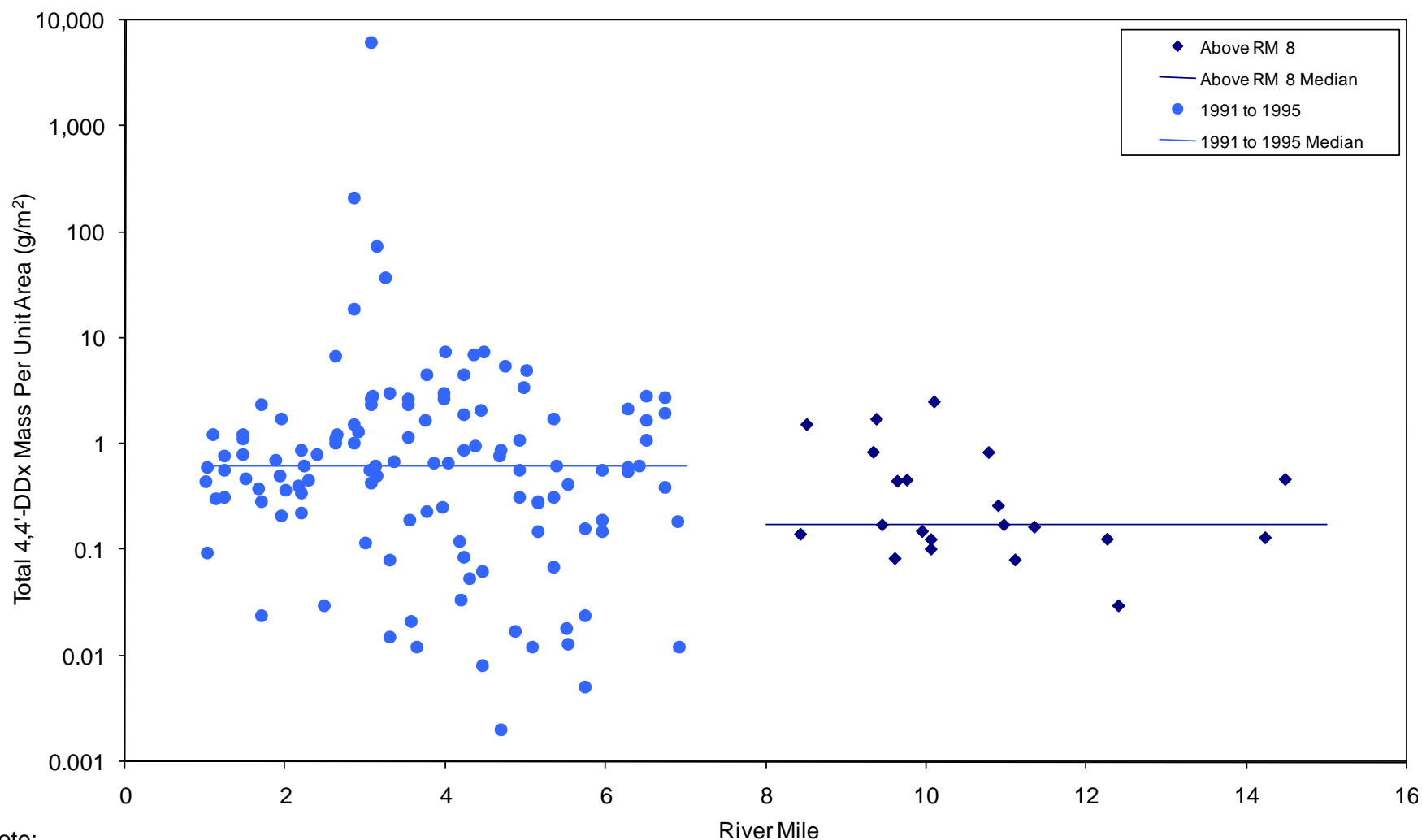
1. Vertical scale is logarithmic.
2. Incomplete cores from 1991 to 1995 were not extrapolated and thus provide a minimum inventory estimate. Approximately 66 percent of 1991-1995 cores were incomplete.



Total 4,4'-DDx MPA versus River Mile  
(As Measured)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

Figure 16-11a

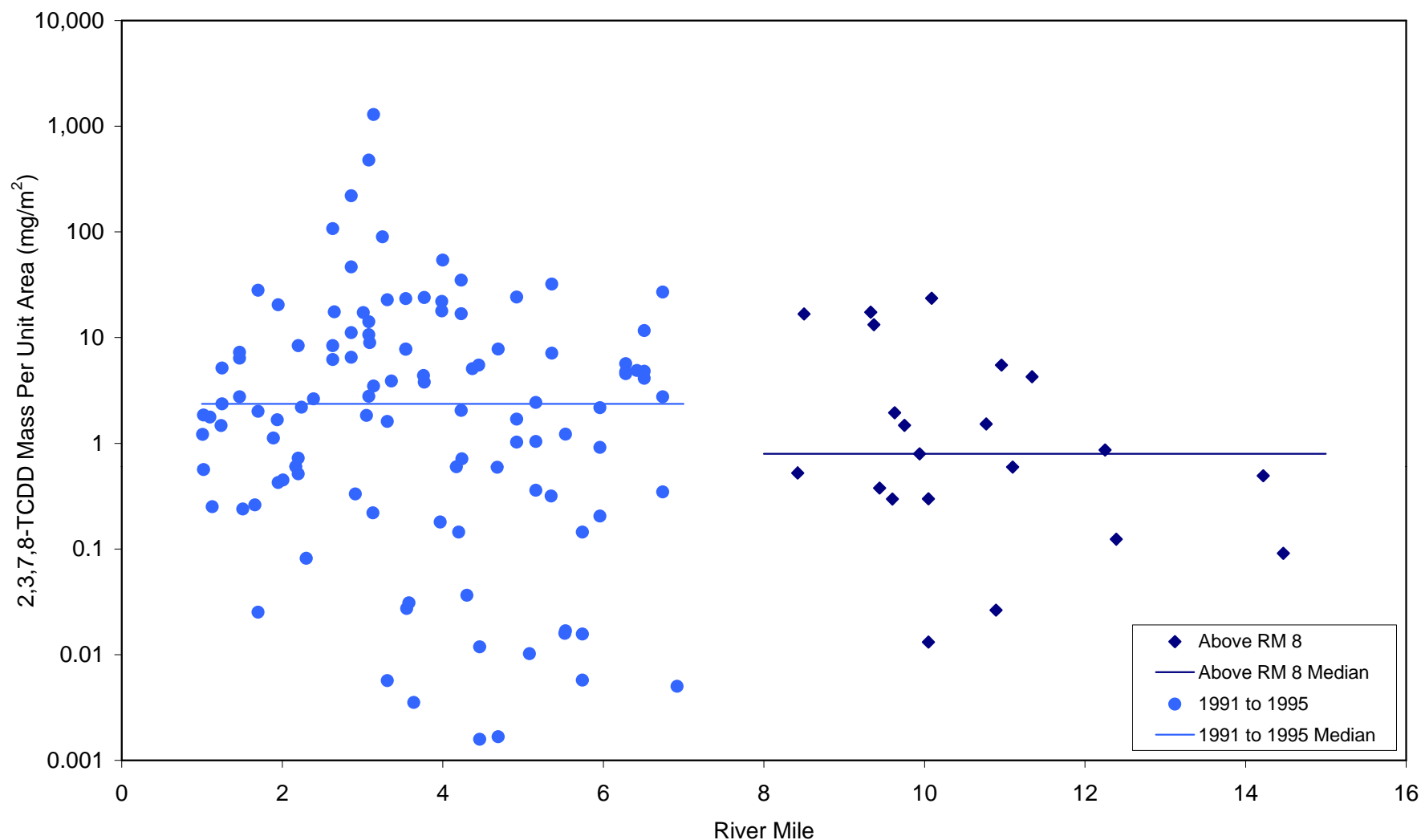
2009



Total 4,4'-DDx MPA versus River Mile  
(With Extrapolated Cores)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

Figure 16-11b

2009



Note:

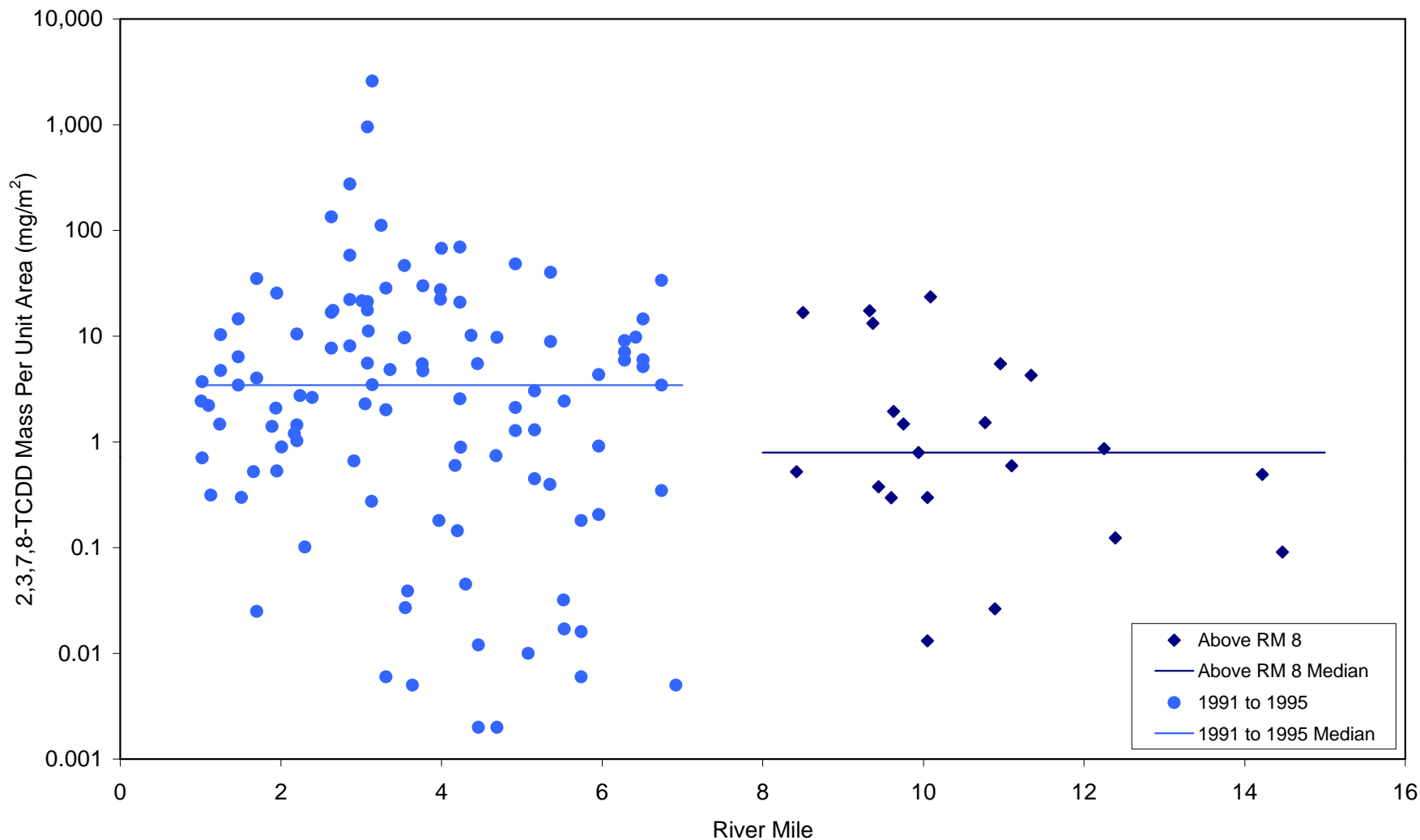
1. Vertical scale is logarithmic.
2. Incomplete cores from 1991 to 1995 were not extrapolated and thus provide a minimum inventory estimate. Approximately 79 percent of 1991-1995 cores were incomplete.



2,3,7,8-TCDD MPA versus River Mile  
(As Measured)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

Figure 16-11c

2009



Note:

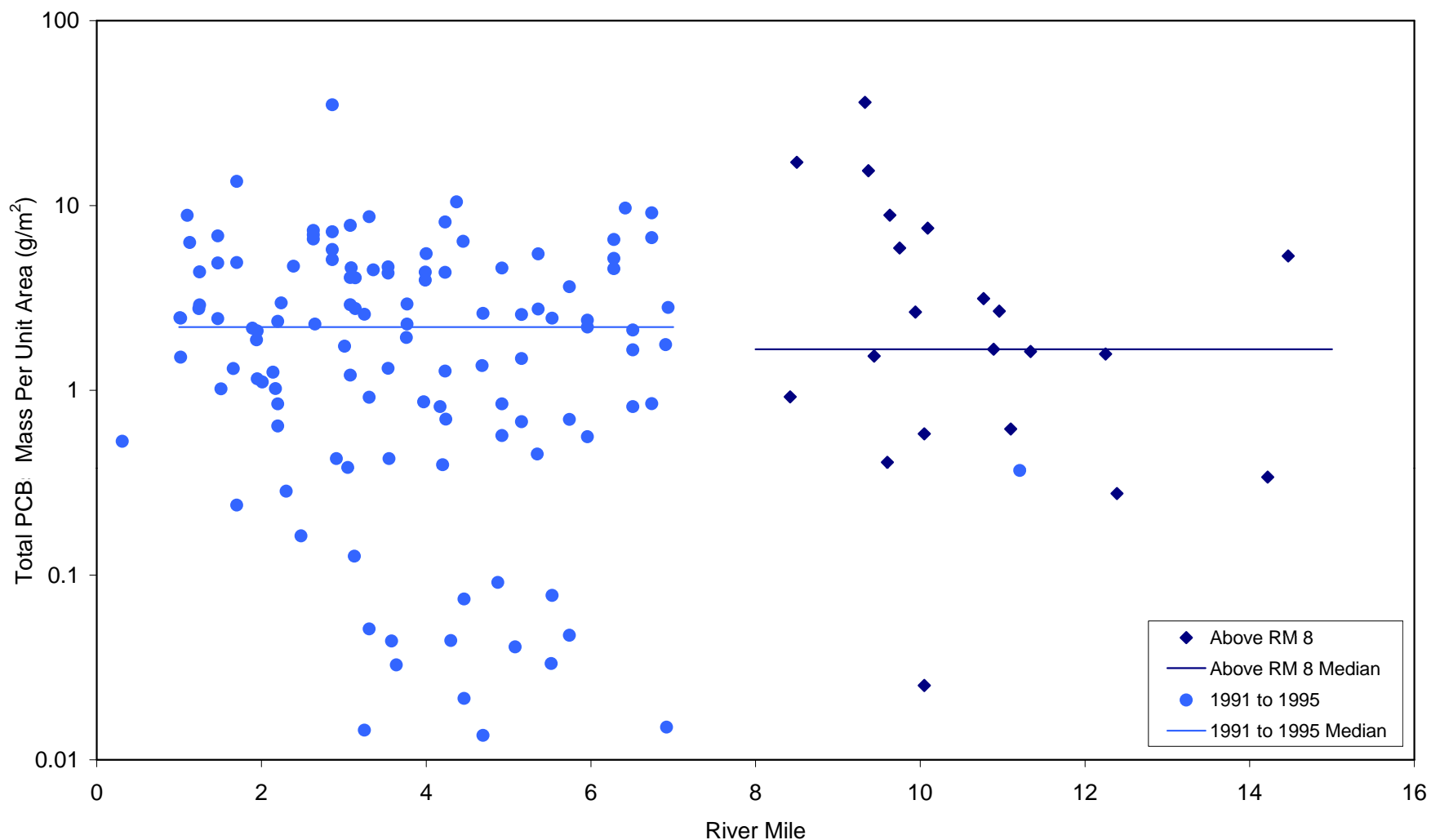
1. Vertical scale is logarithmic.
2. Incomplete cores from 1991 to 1995 were extrapolated to provide a complete inventory estimate. Approximately 79 percent of 1991-1995 cores were incomplete.



2,3,7,8-TCDD MPA versus River Mile  
(With Extrapolated Cores)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

Figure 16-11d

2009



Note:

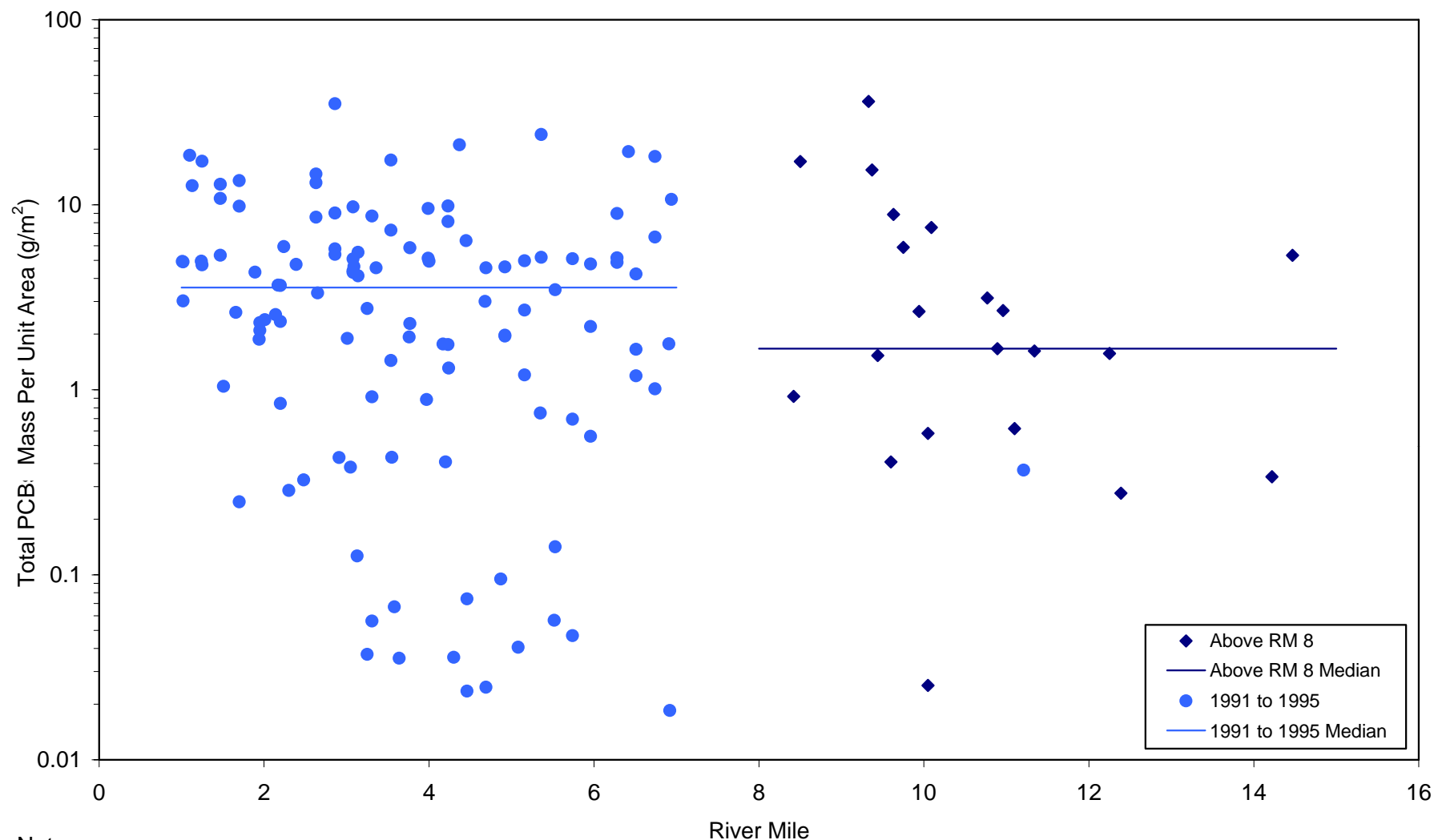
1. Vertical scale is logarithmic.
2. Incomplete cores from 1991 to 1995 were not extrapolated and thus provide a minimum inventory estimate. Approximately 44 percent of 1991-1995 cores were incomplete.



Total PCB MPA versus River Mile  
(As Measured)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

Figure 16-11e

2009



Note:

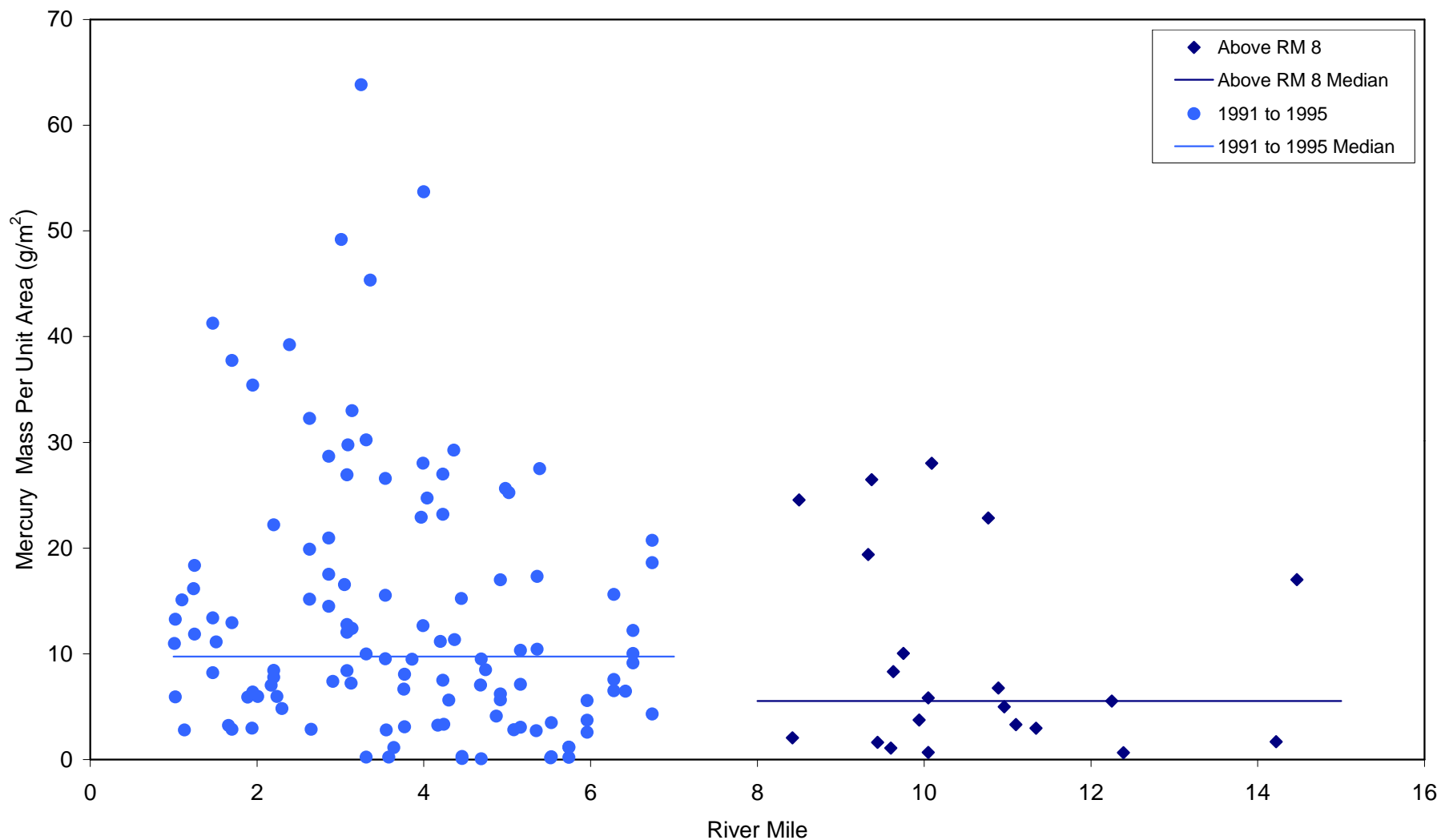
1. Vertical scale is logarithmic.
2. Incomplete cores from 1991 to 1995 were extrapolated to provide a complete inventory estimate. Approximately 44 percent of 1991-1995 cores were incomplete.



Total PCB MPA versus River Mile  
(With Extrapolated Cores)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

Figure 16-11f

2009



Note:

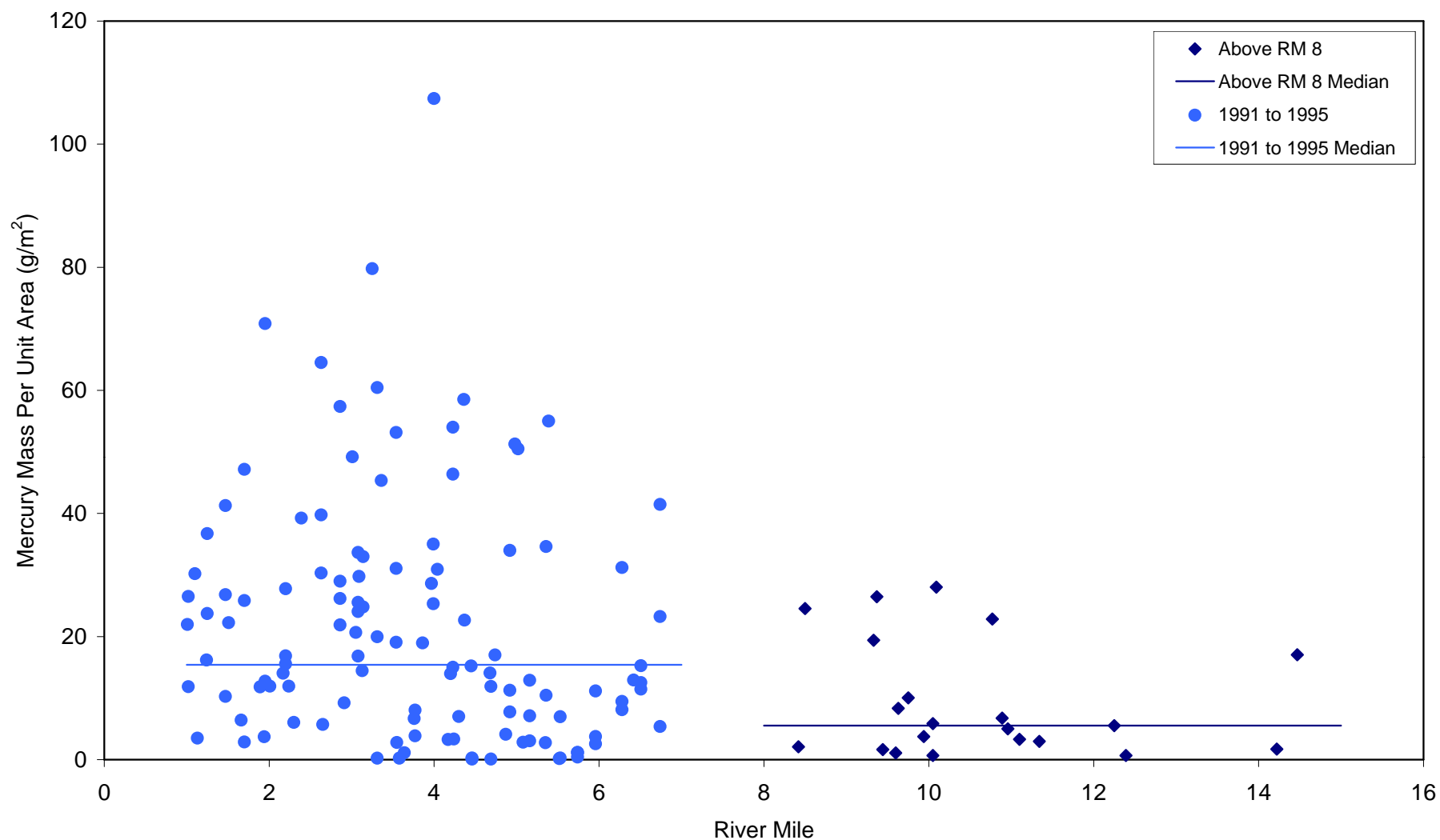
1. Incomplete cores from 1991 to 1995 were not extrapolated and thus provide a minimum inventory estimate. Approximately 72 percent of 1991-1995 cores were incomplete.



Mercury MPA versus River Mile  
(As Measured)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

Figure 16-11g

2009



Note:

1. Incomplete cores from 1991 to 1995 were extrapolated to provide a complete inventory estimate. Approximately 72 percent of 1991-1995 cores were incomplete.



Mercury MPA versus River Mile  
(With Extrapolated Cores)  
2008, RM 8 to 15 and 1991-1995, RM 1 to 7  
*Lower Passaic River Restoration Project*

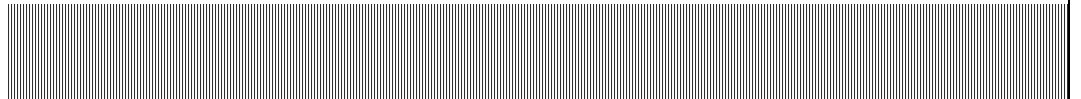
Figure 16-11h

2009

Agency Backcheck  
Comprehensive Conceptual Site Model  
Lower Passaic River Restoration Project

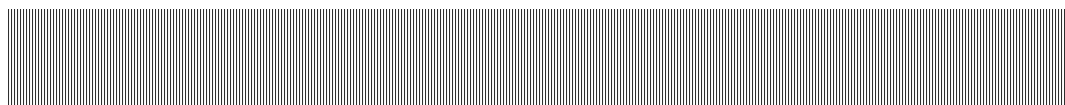
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## Section VI

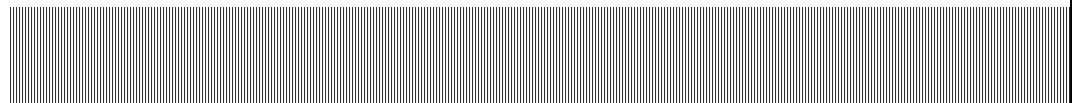


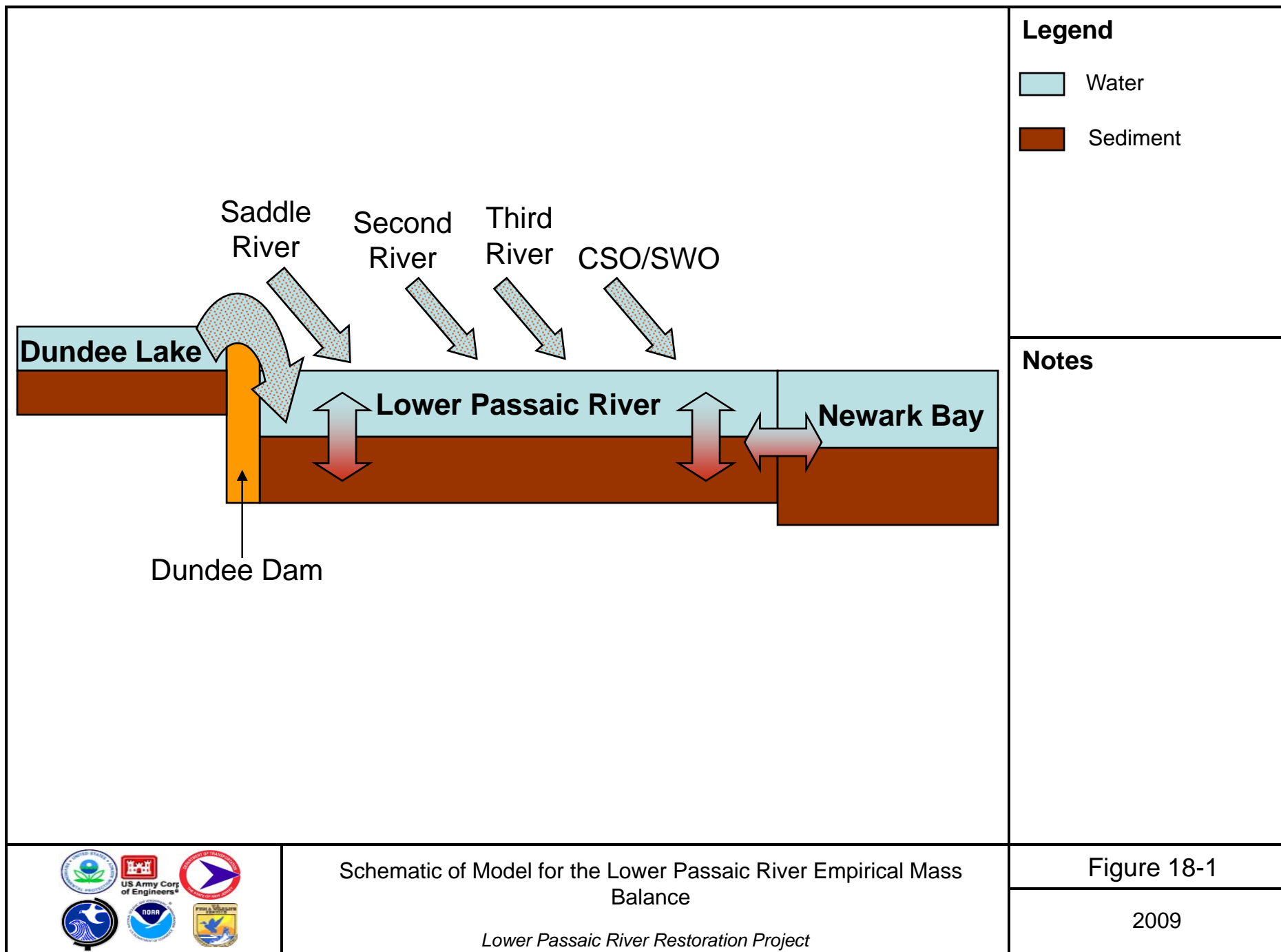
## Chapter 17 Figures

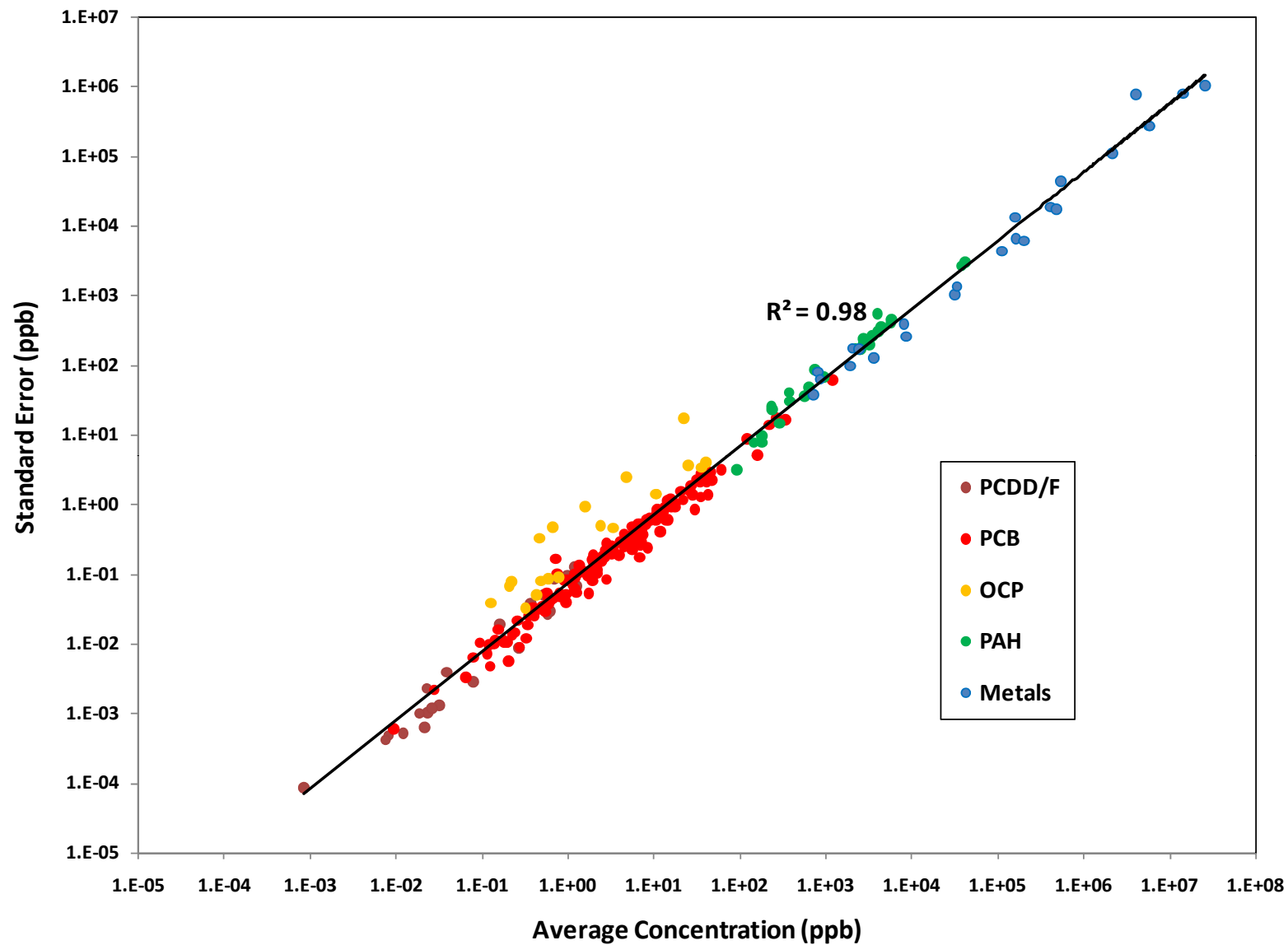
**There are no figures associated with this chapter.**



## Chapter 18 Figures







Relationship between Average Chemical Concentration and Standard Error for the Recently Deposited Sediments in the Lower Passaic River

*Lower Passaic River Restoration Project*

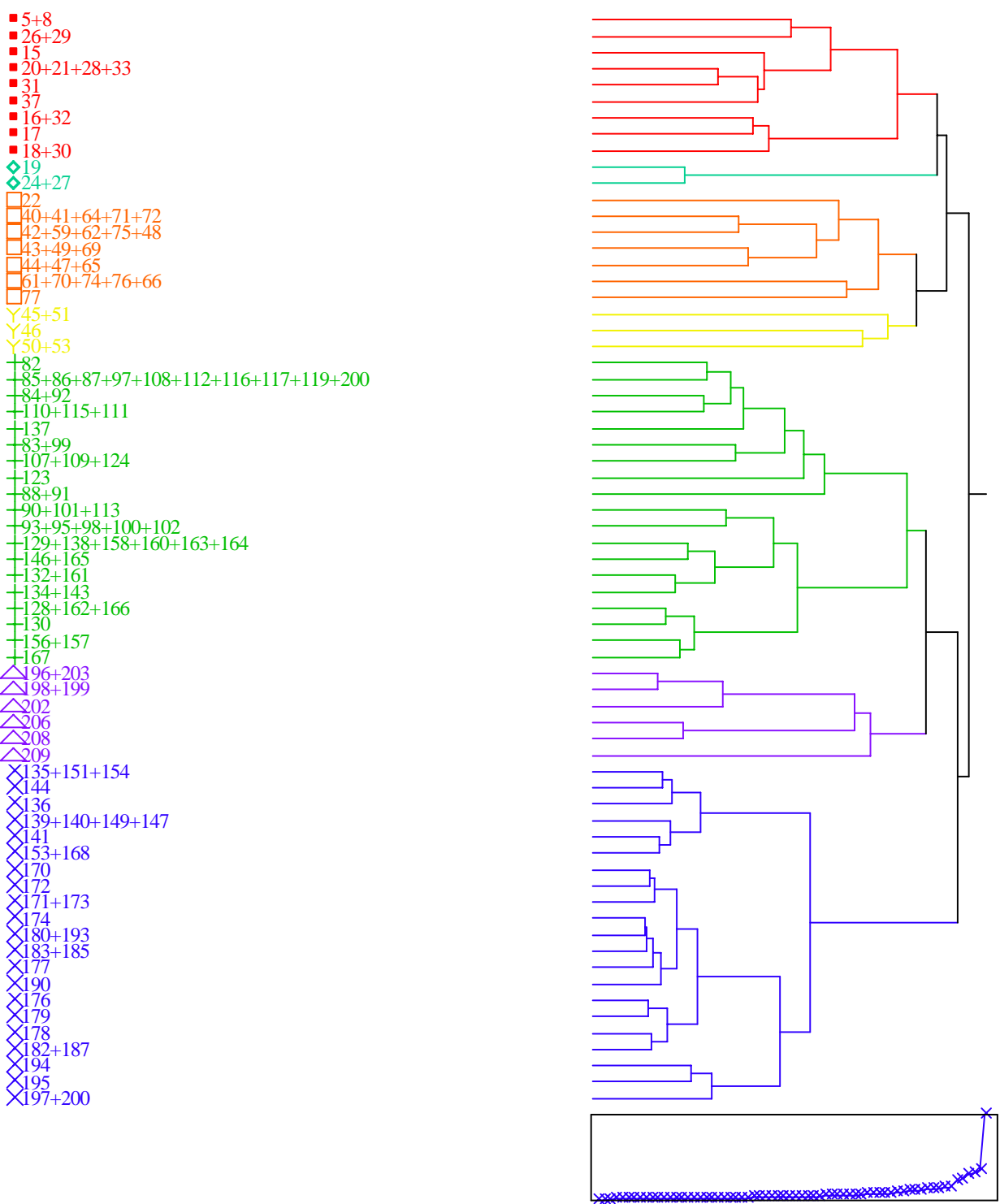
Figure 18-2

2009

# Hierarchical Clustering

Method = Ward

## Dendrogram



PCB Congener Cluster Analysis

Lower Passaic River Restoration Project

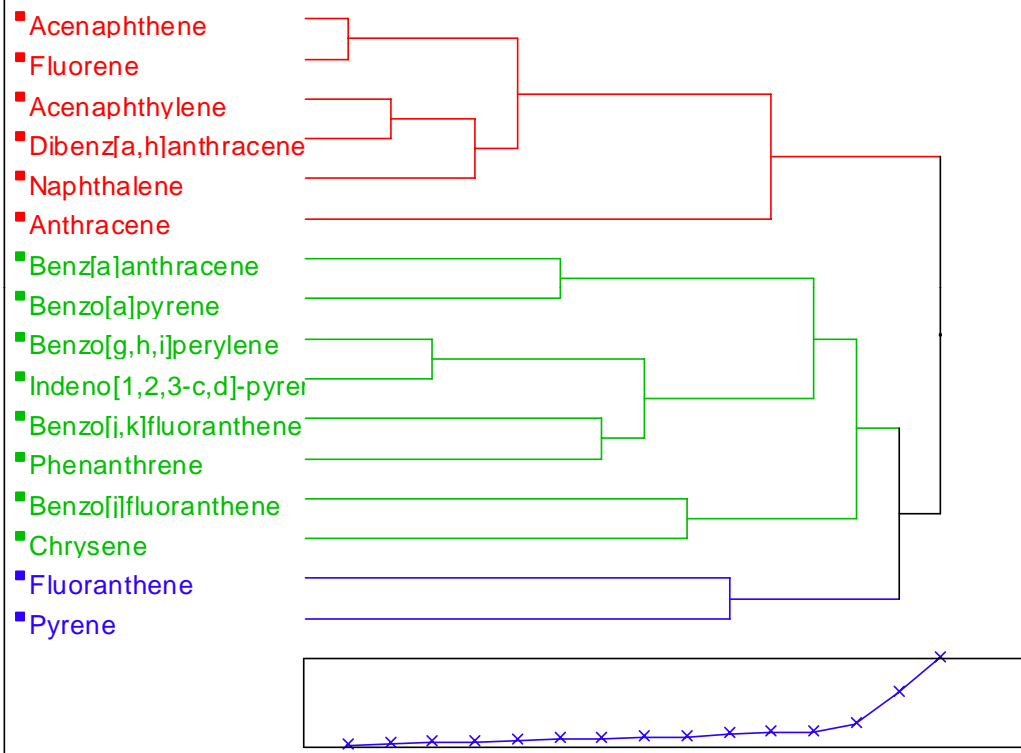
Figure 18-3

2009

## Hierarchical Clustering

Method =Ward

### Dendrogram



Cluster Analysis for PAHs

Lower Passaic River Restoration Project

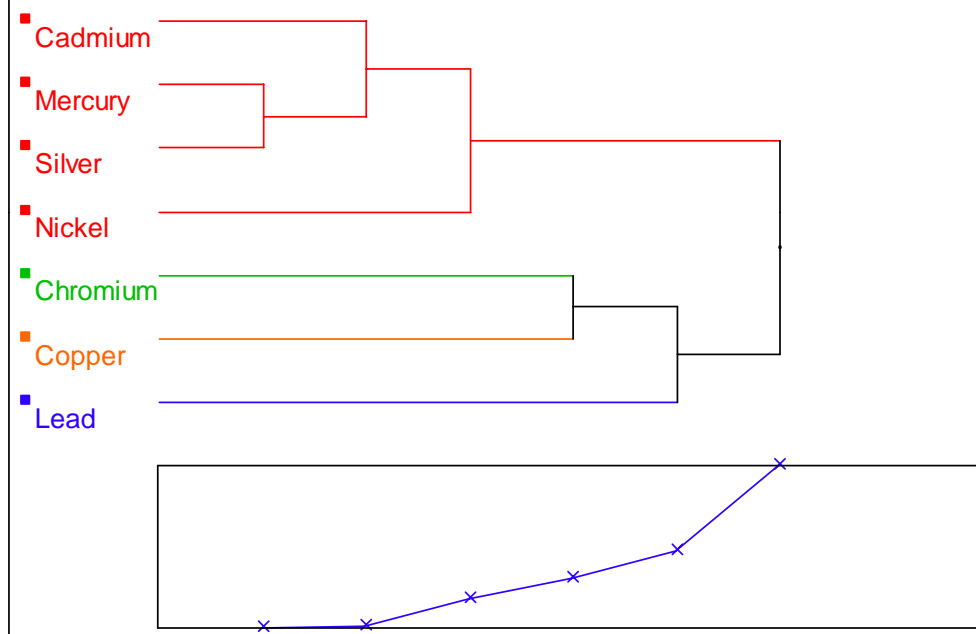
Figure 18-4

2009

## Hierarchical Clustering

Method = Ward

### Dendrogram



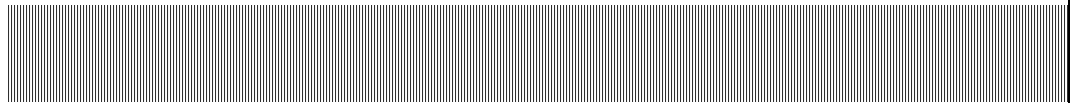
Cluster Analysis for Metals

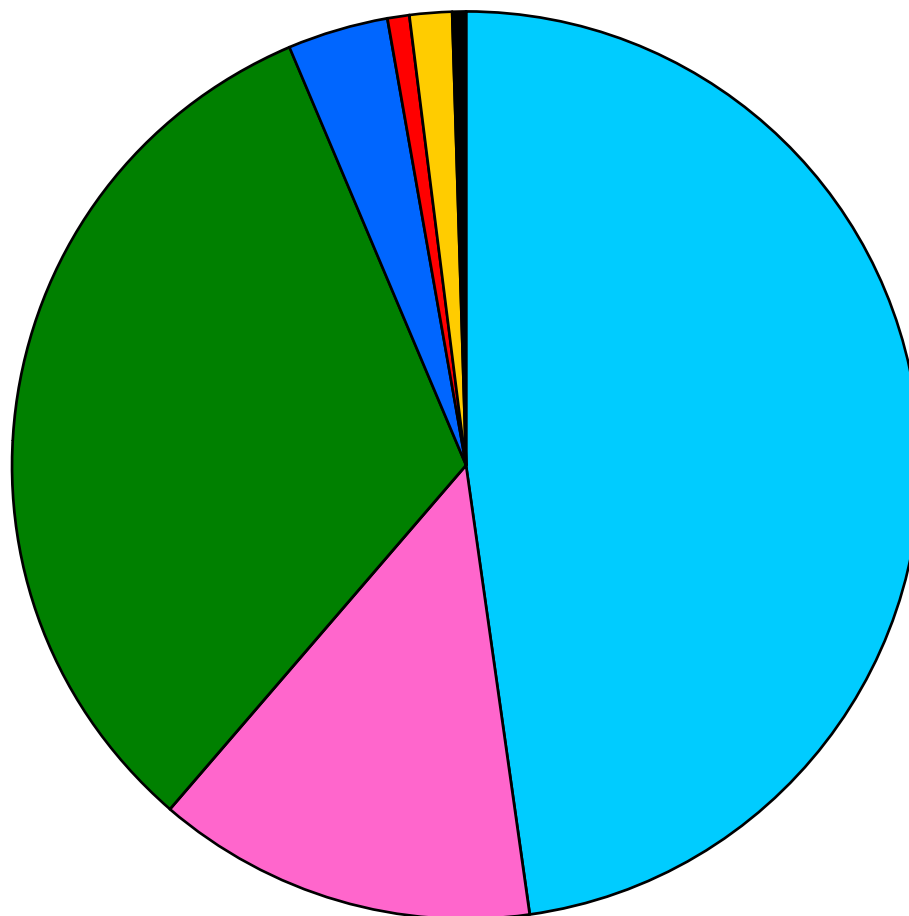
*Lower Passaic River Restoration Project*

Figure 18-5

2009

## Chapter 19 Figures





### Legend

- Upper Passaic River
- Saddle River
- Second River/SWO
- Third River
- CSO
- Newark Bay Northern End
- Resuspension (Lower Passaic River)

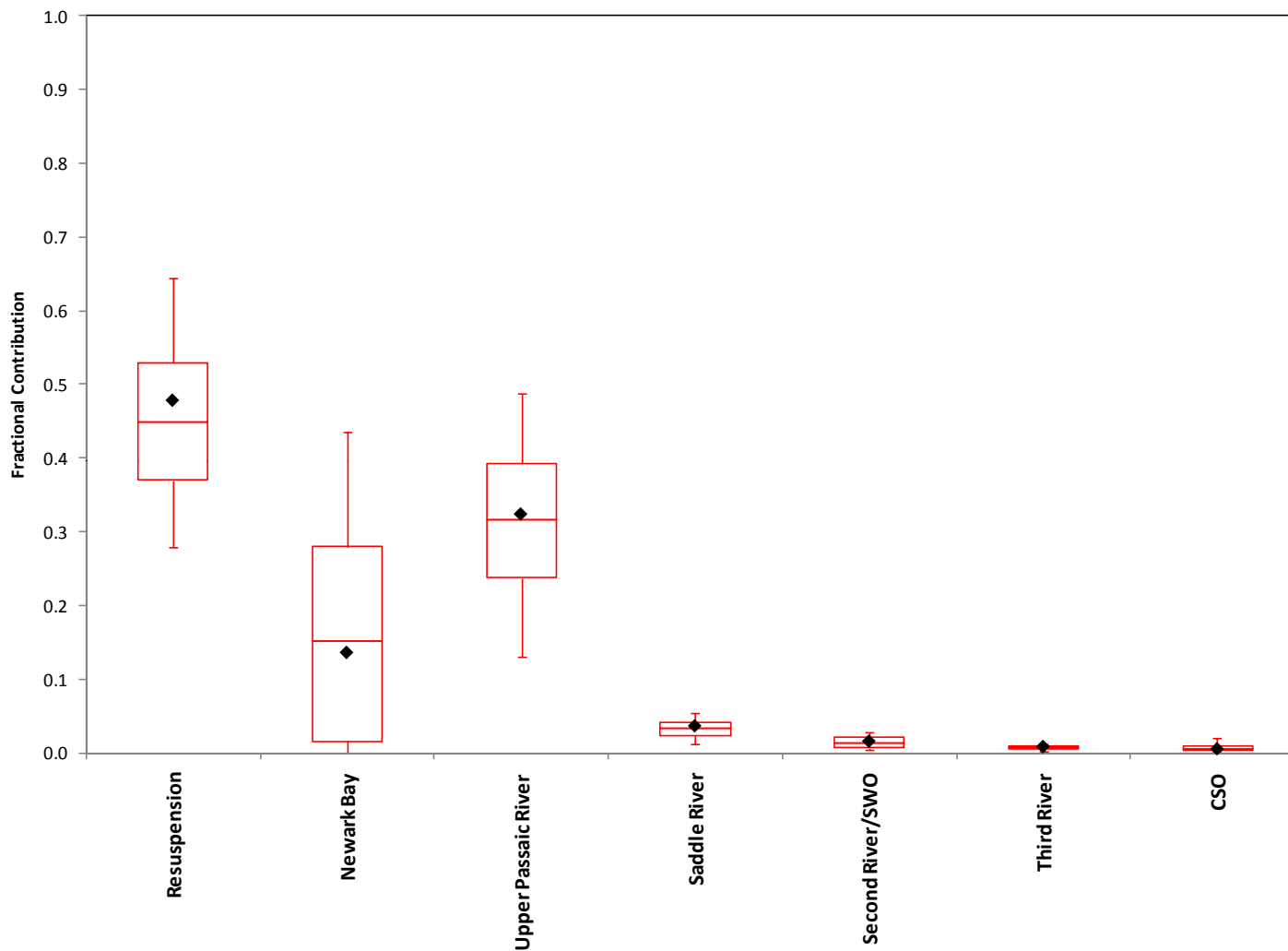


Solid Contribution to the Lower Passaic River

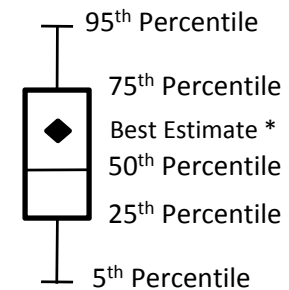
*Lower Passaic River Restoration Project*

Figure 19-1

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.

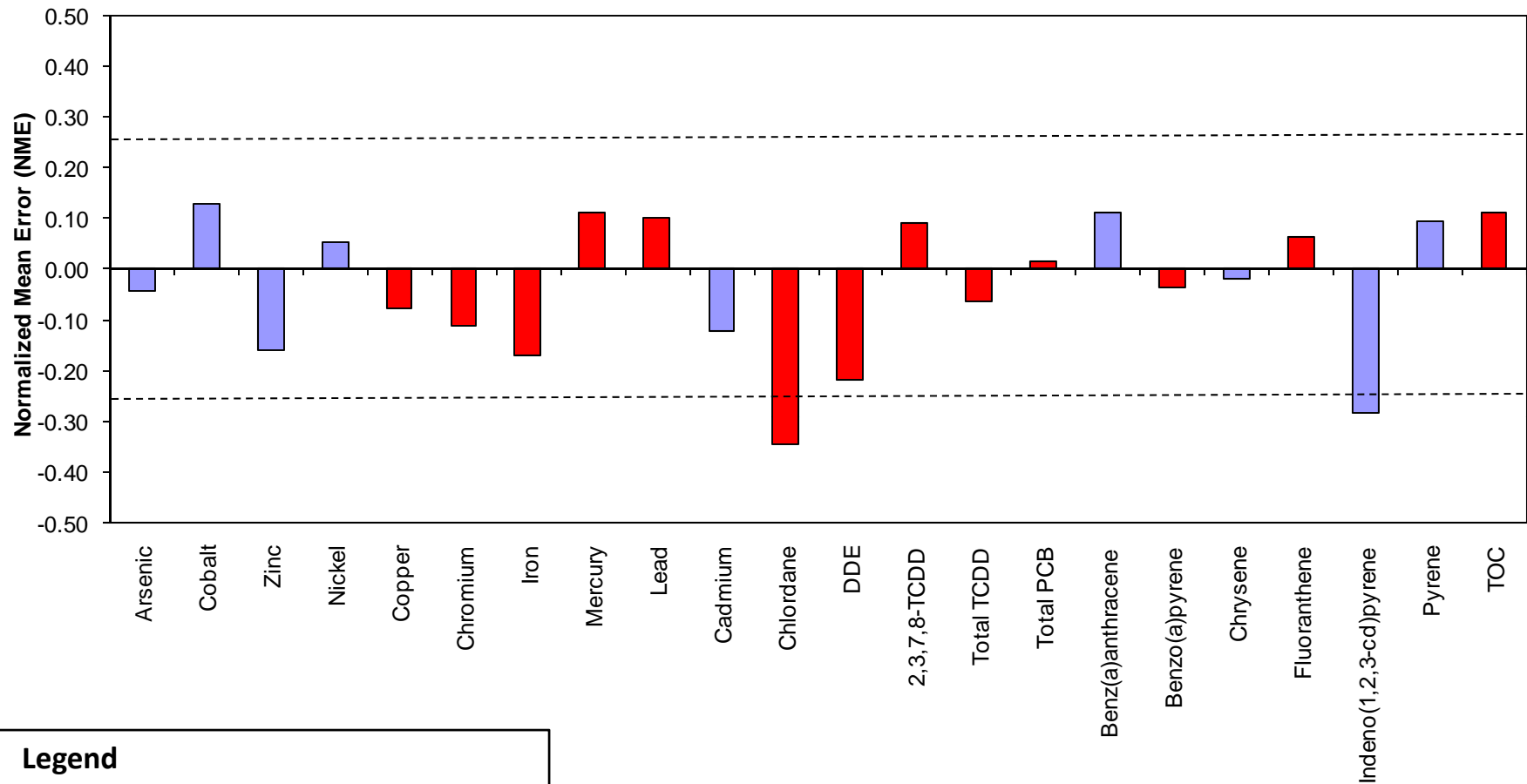


Fractional Contribution for Solids  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

Figure 19-2

2009



### Legend

----- 25%

■ Chemical directly included in model.

■ Chemical used to evaluate optimized model.



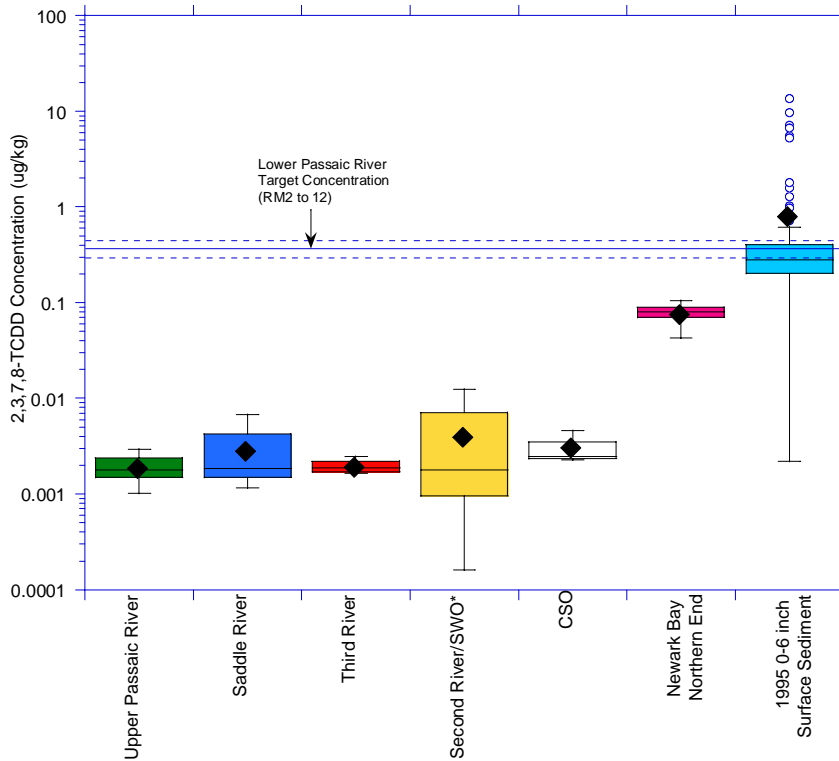
Percent Fit to the Lower Passaic River

Lower Passaic River Restoration Project

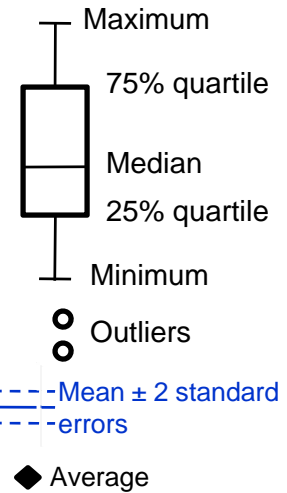
Figure 19-3

2009

### Source Concentration of 2,3,7,8-TCDD



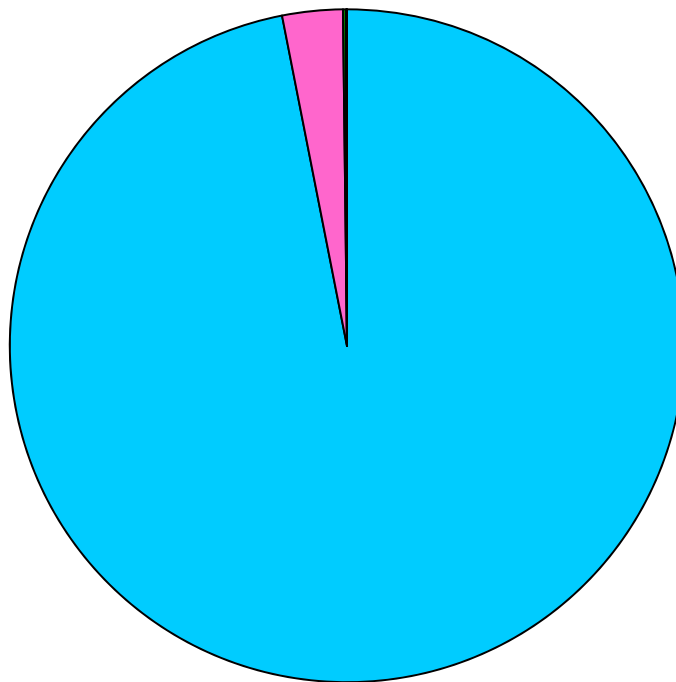
### Legend



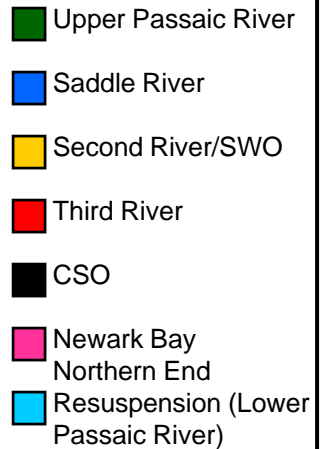
### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

### Best Estimate Mass Balance for 2,3,7,8-TCDD



### Legend

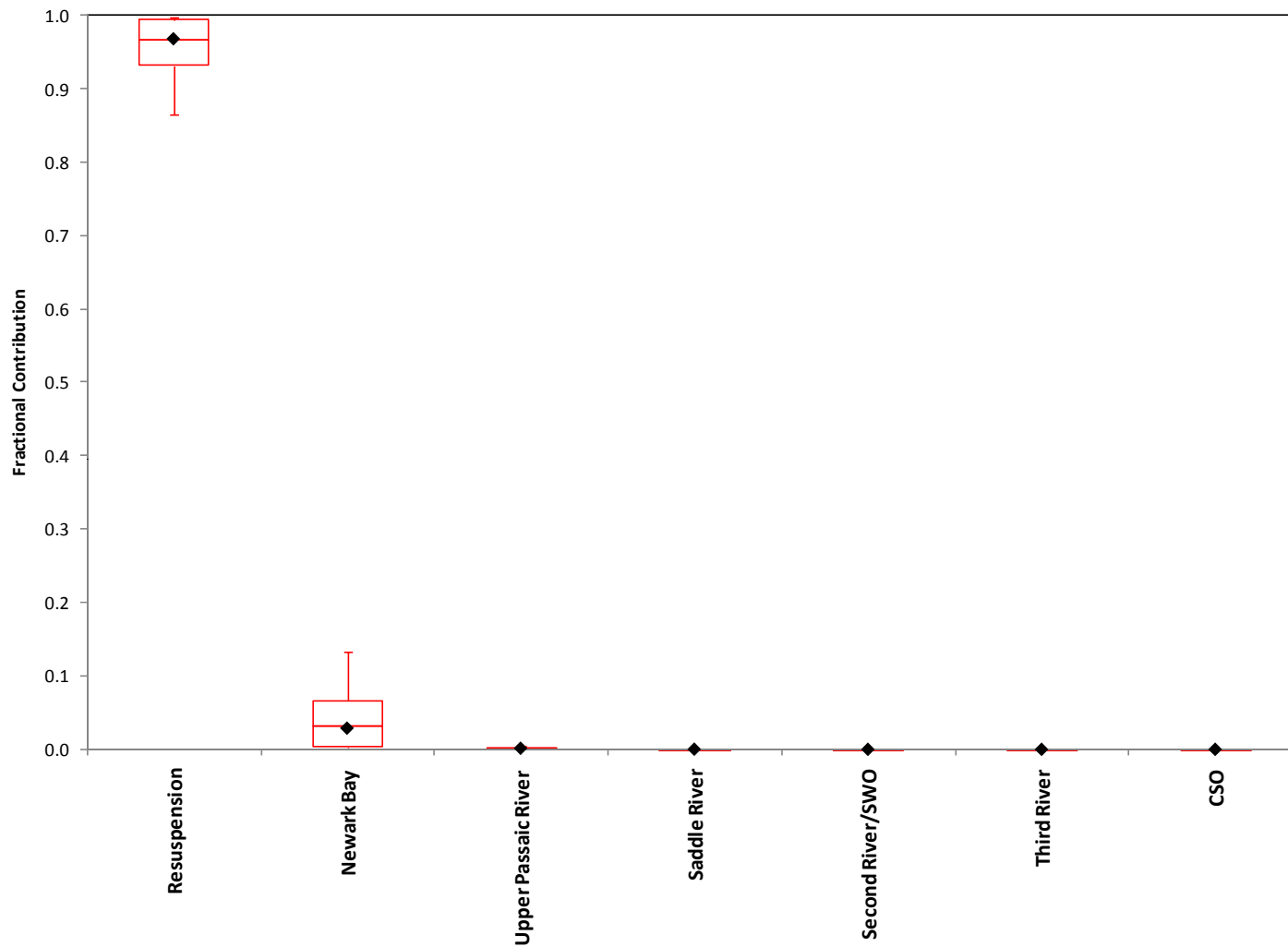


Source Concentration and Mass Balance for  
2,3,7,8-TCDD

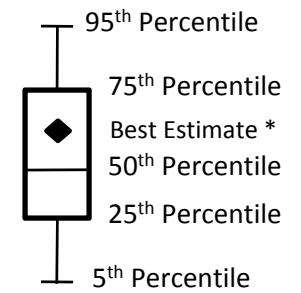
Lower Passaic River Restoration Project

Figure 19-4A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



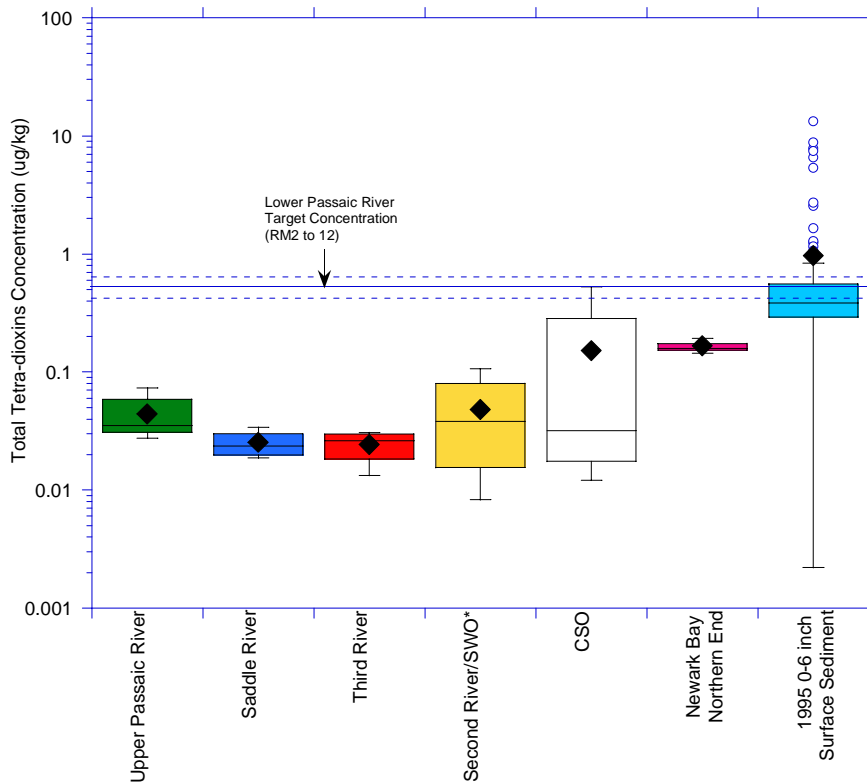
Fractional Contribution for 2,3,7,8-TCDD  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

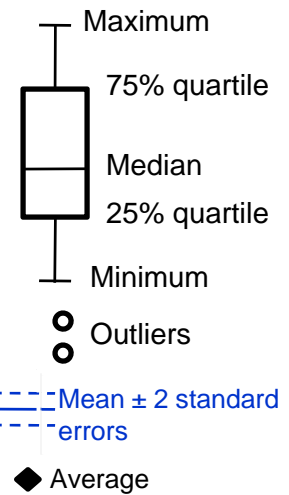
Figure 19-4B

2009

### Source Concentration of Total Tetra-dioxins



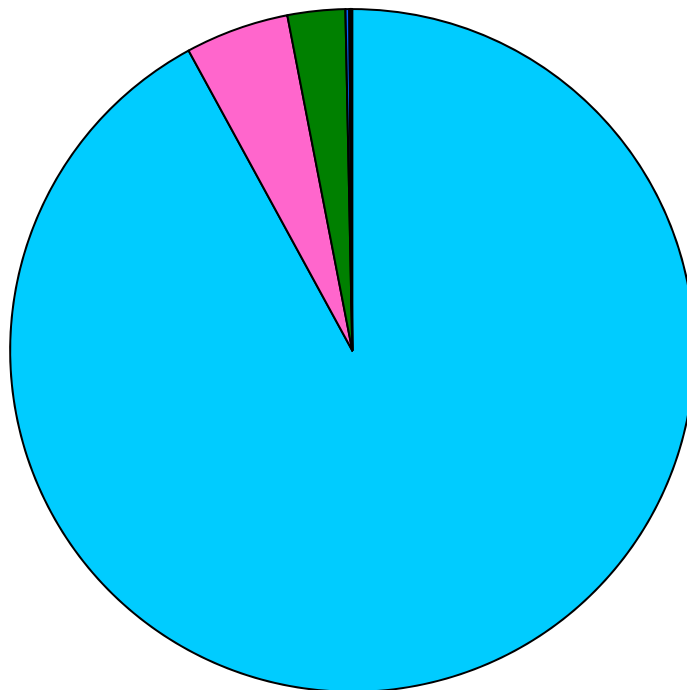
### Legend



### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

### Best Estimate Mass Balance for Total Tetra-dioxins



### Legend

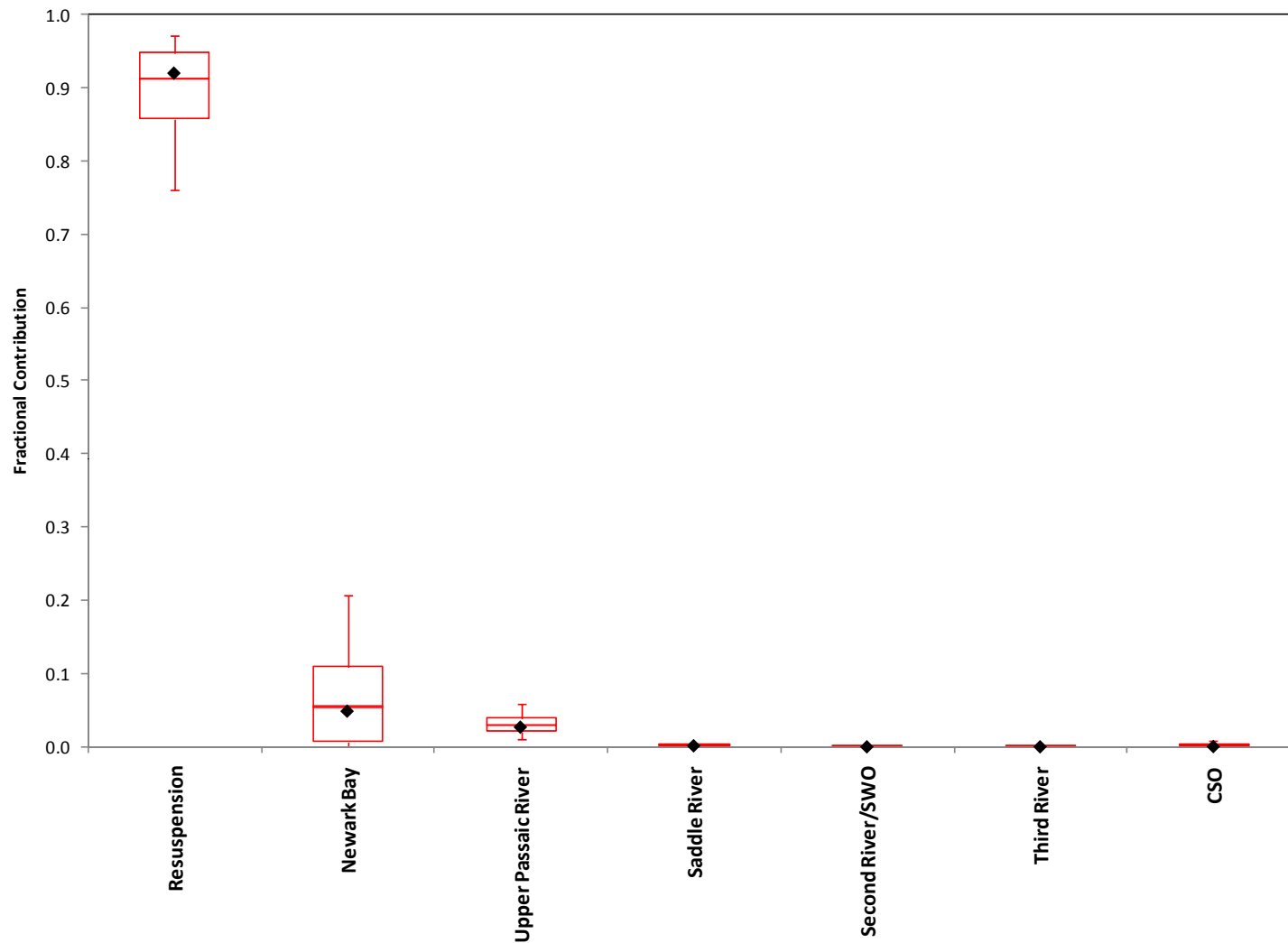


Source Concentration and Mass Balance for Total Tetra-dioxins

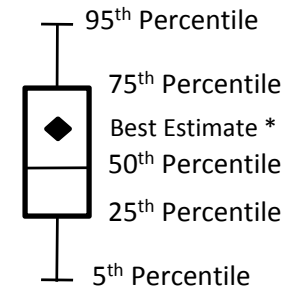
Lower Passaic River Restoration Project

Figure 19-5A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



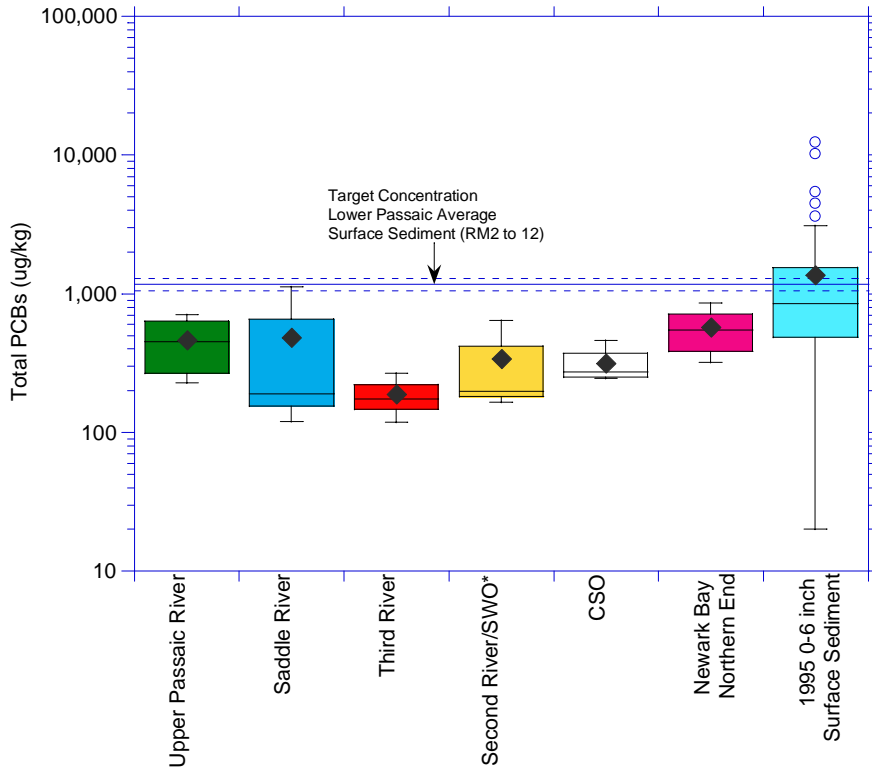
Fractional Contribution for Total Tetra-Dioxins  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

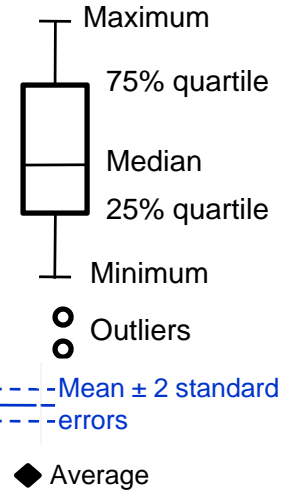
Figure 19-5B

2009

### Source Concentration of Total PCBs



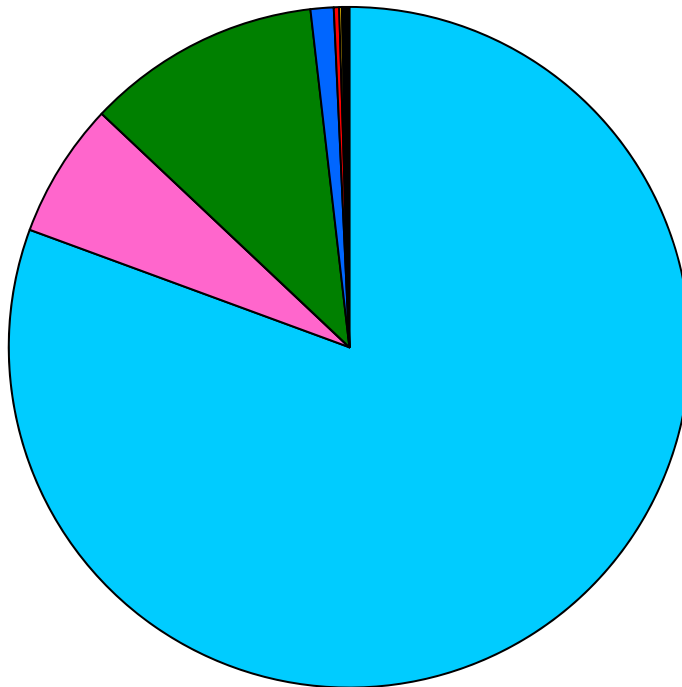
### Legend



### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

### Best Estimate Mass Balance for Total PCBs



### Legend

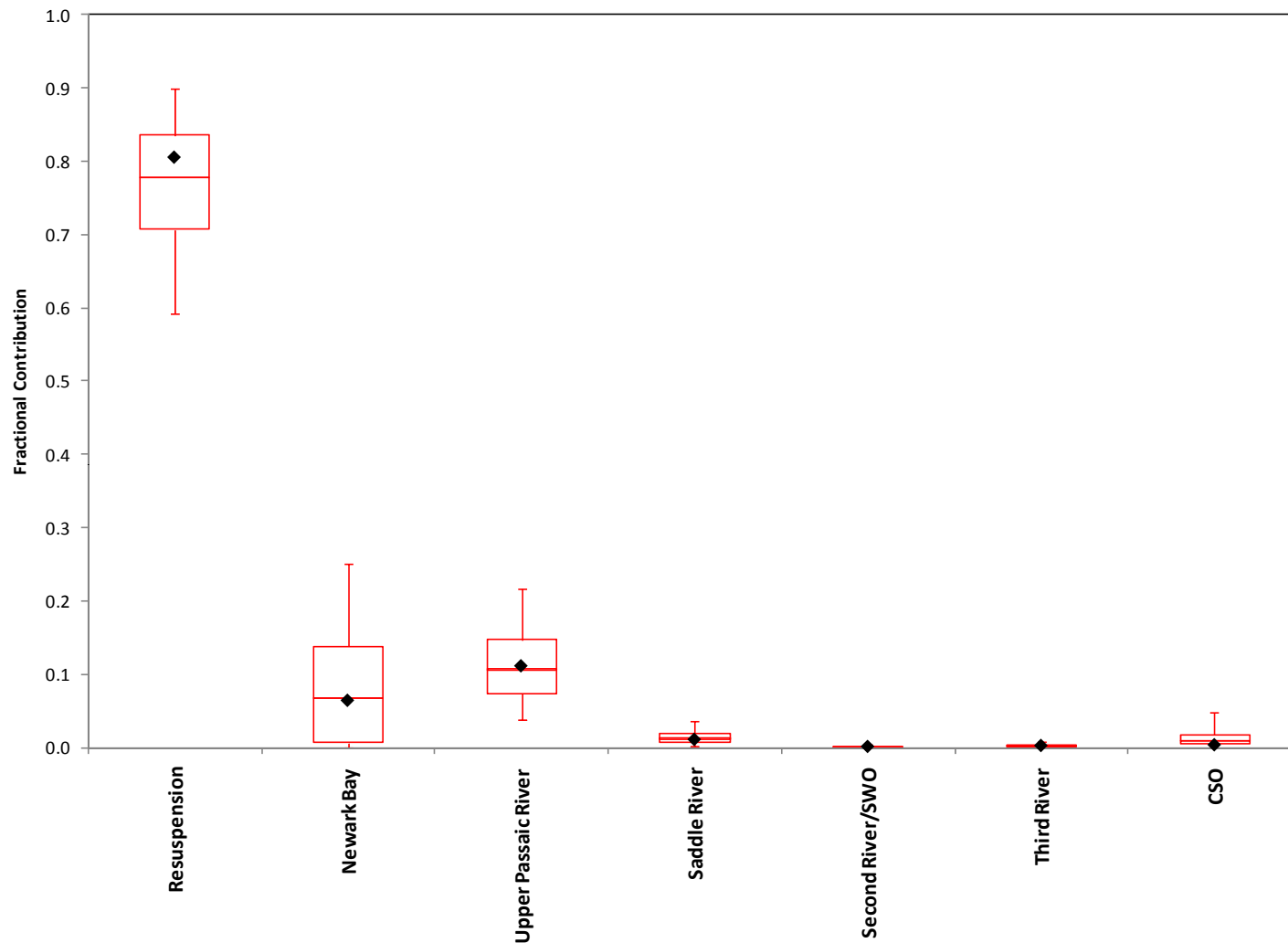


Source Concentration and Mass Balance for  
Total PCBs

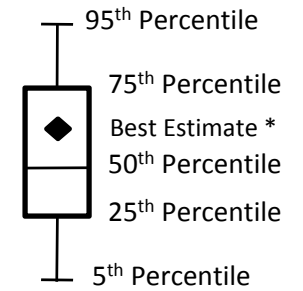
Lower Passaic River Restoration Project

Figure 19-6A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



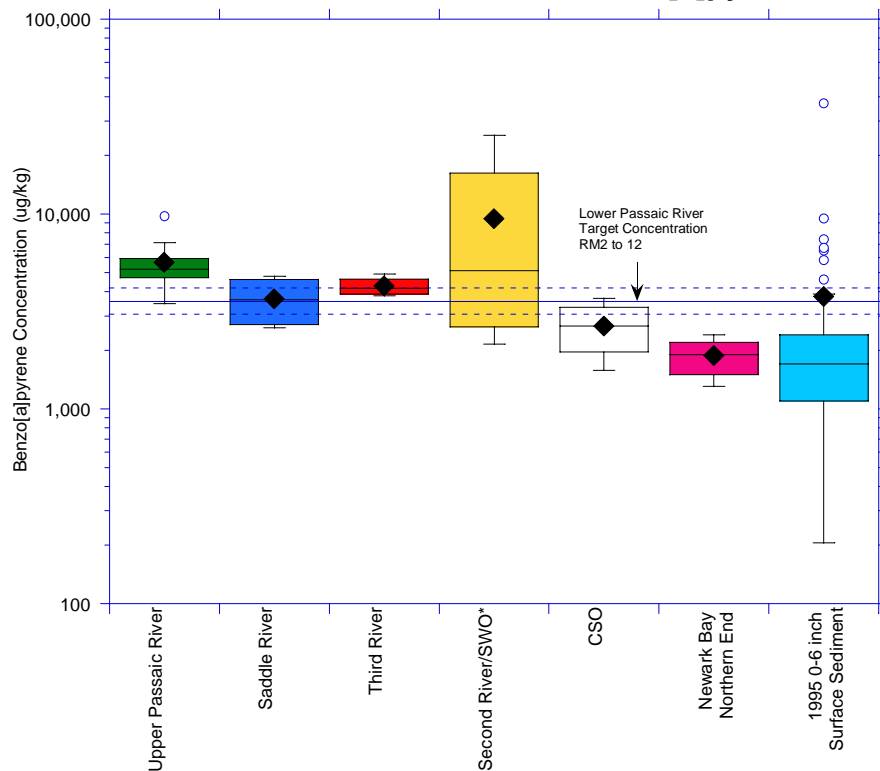
Fractional Contribution for Total PCBs  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

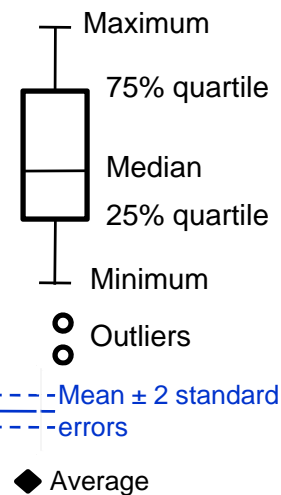
Figure 19-6B

2009

## Source Concentration of Benzo[a]pyrene



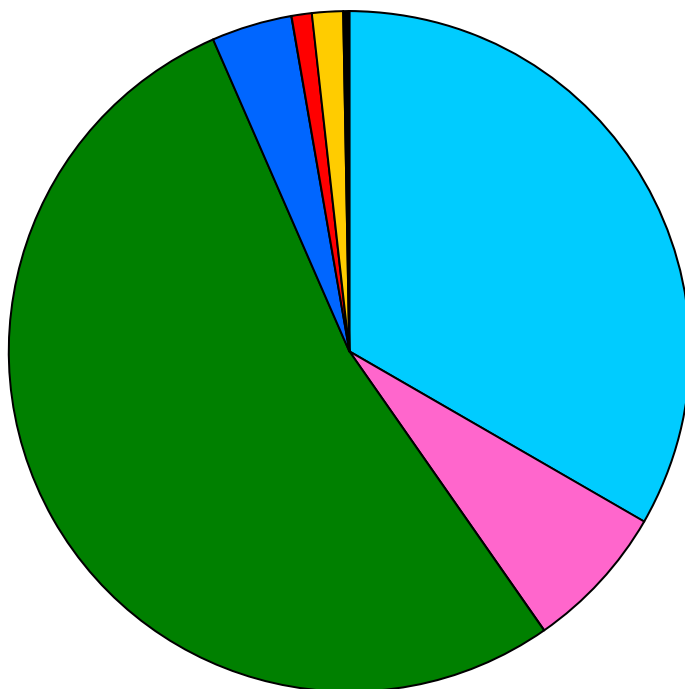
### Legend



### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

## Best Estimate Mass Balance for Benzo[a]pyrene



### Legend

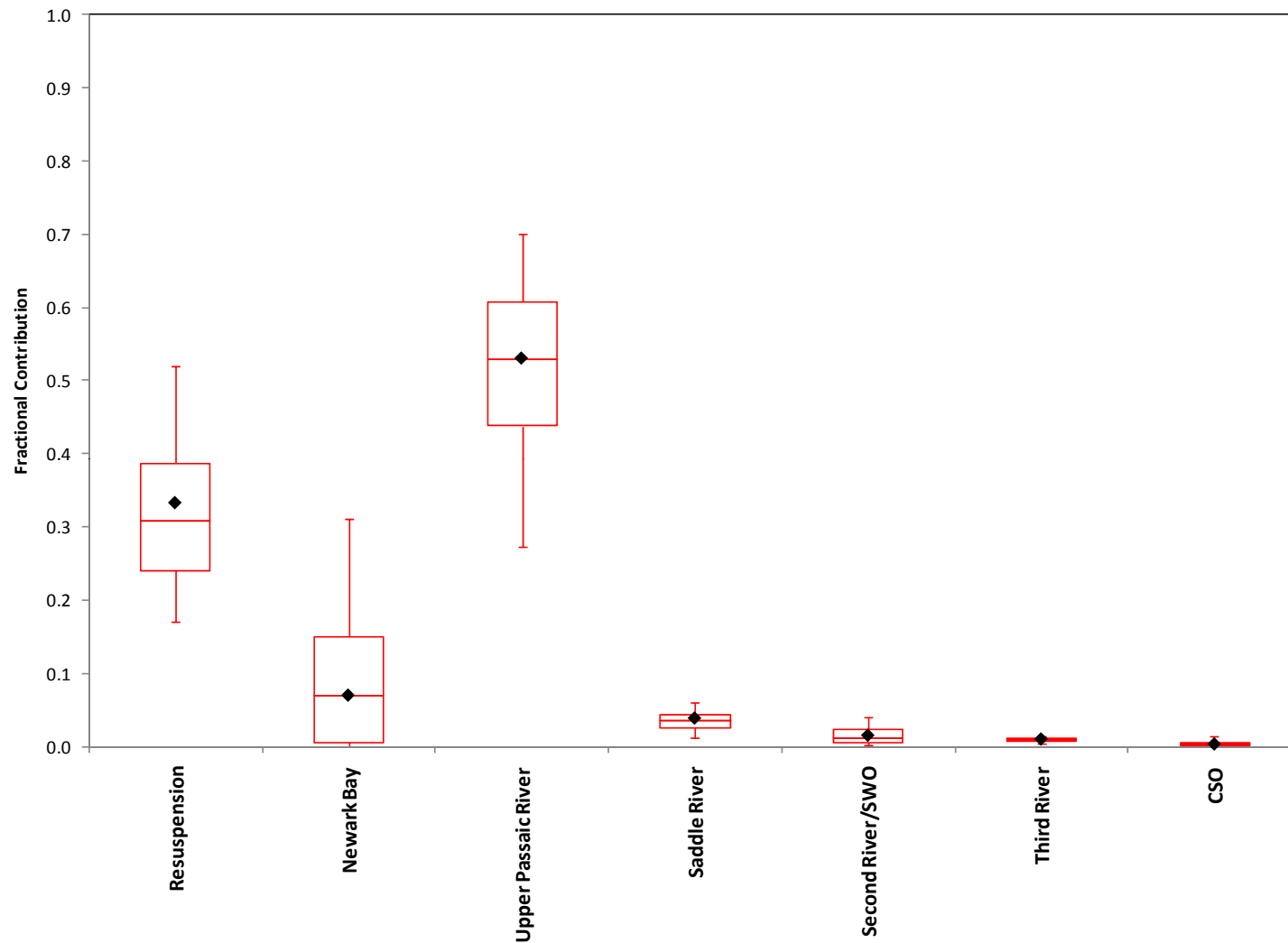


Source Concentration and Mass Balance for Benzo[a]pyrene

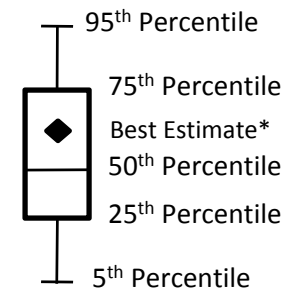
Lower Passaic River Restoration Project

Figure 19-7A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



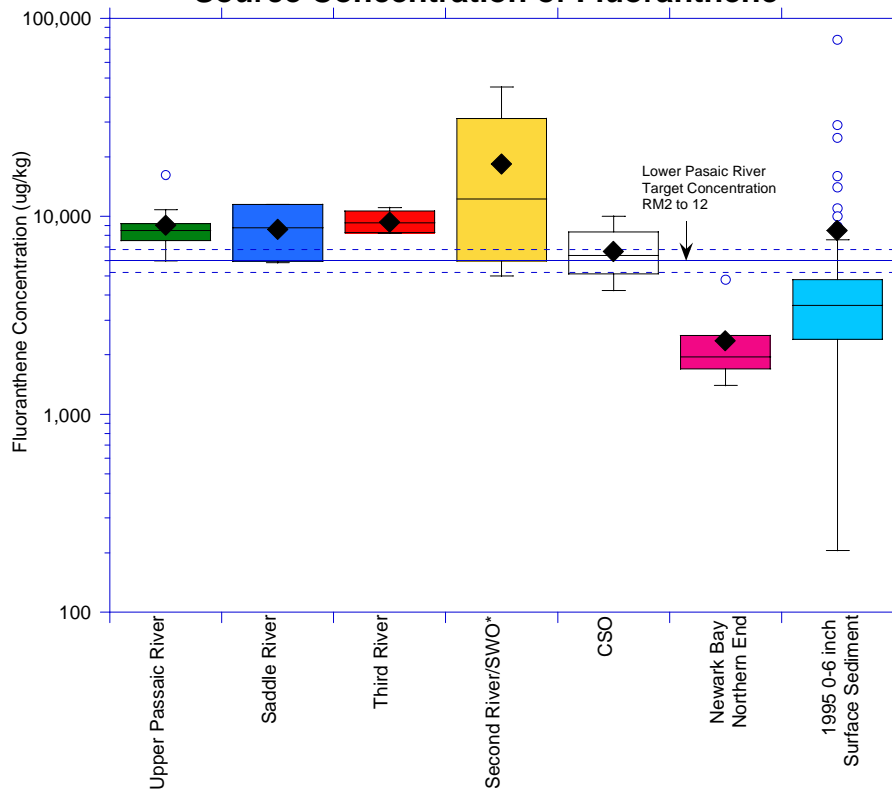
Fractional Contribution for Benzo[a]Pyrene  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

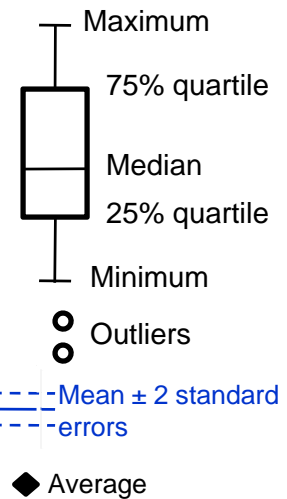
Figure 19-7B

2009

### Source Concentration of Fluoranthene



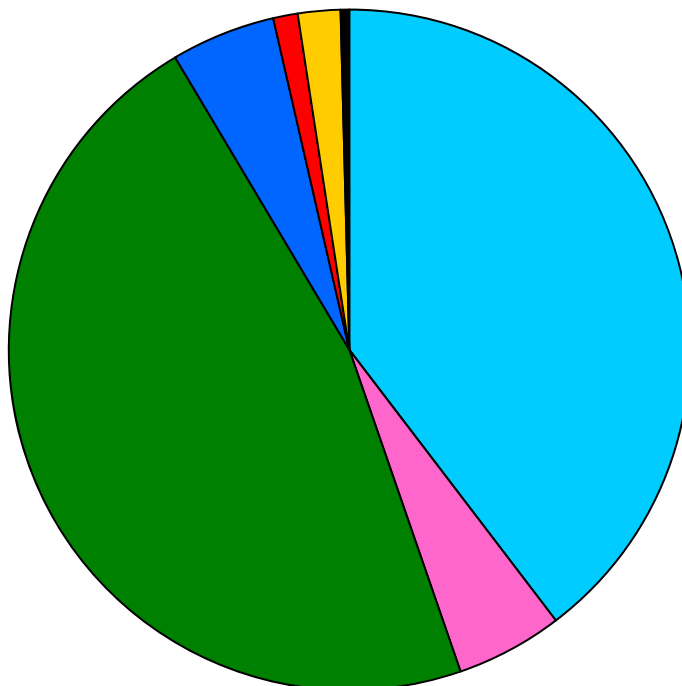
### Legend



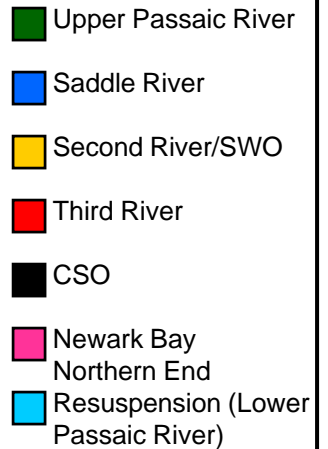
### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

### Best Estimate Mass Balance for Fluoranthene



### Legend

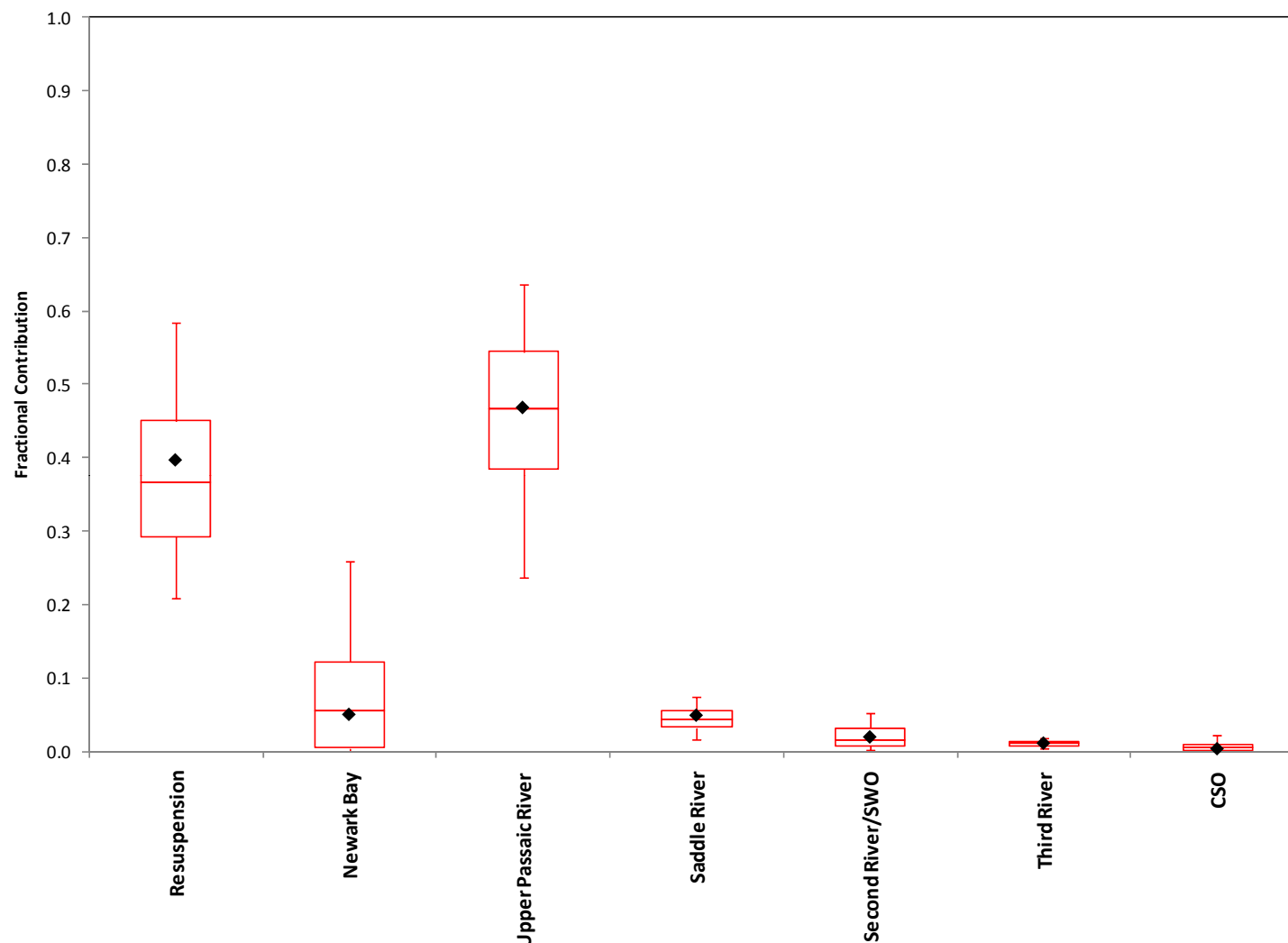


Source Concentration and Mass Balance for Fluoranthene

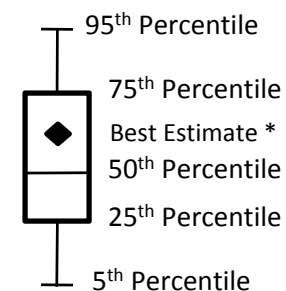
Lower Passaic River Restoration Project

Figure 19-8A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



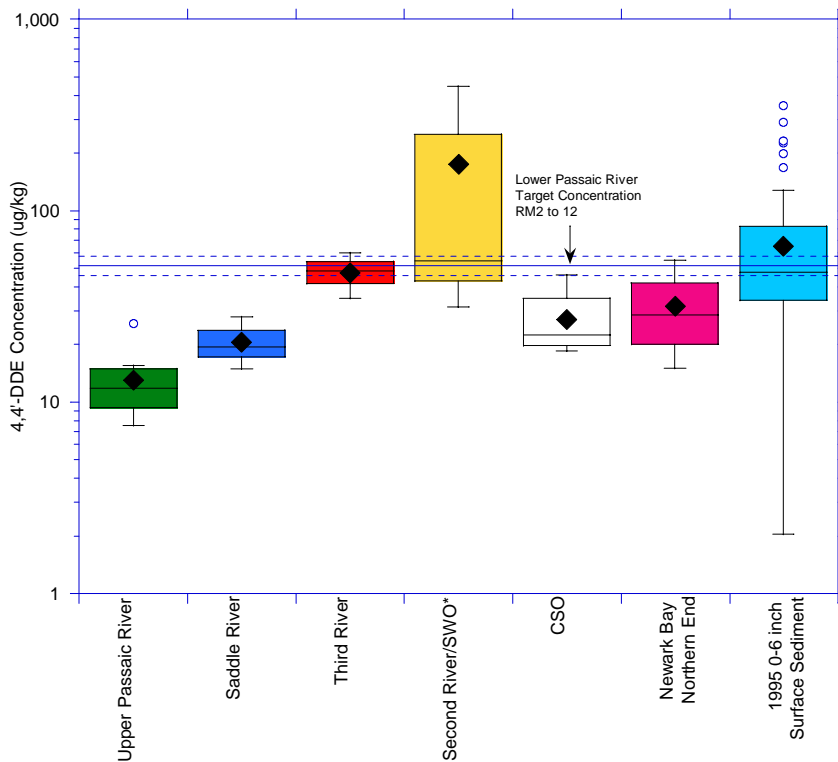
Fractional Contribution for Fluoranthene  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

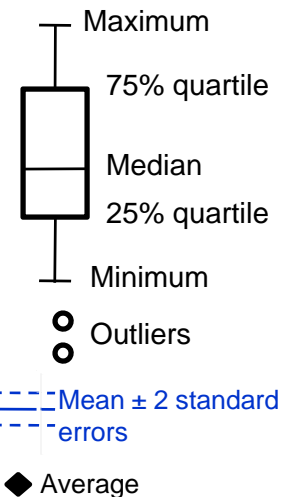
Figure 19-8B

2009

### Source Concentration of 4,4'-DDE



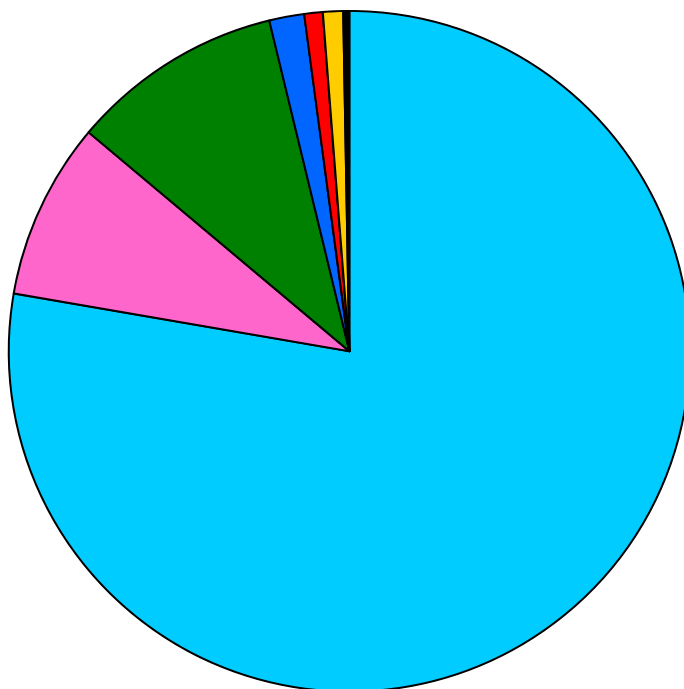
### Legend



### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

### Best Estimate Mass Balance for 4,4'-DDE



### Legend

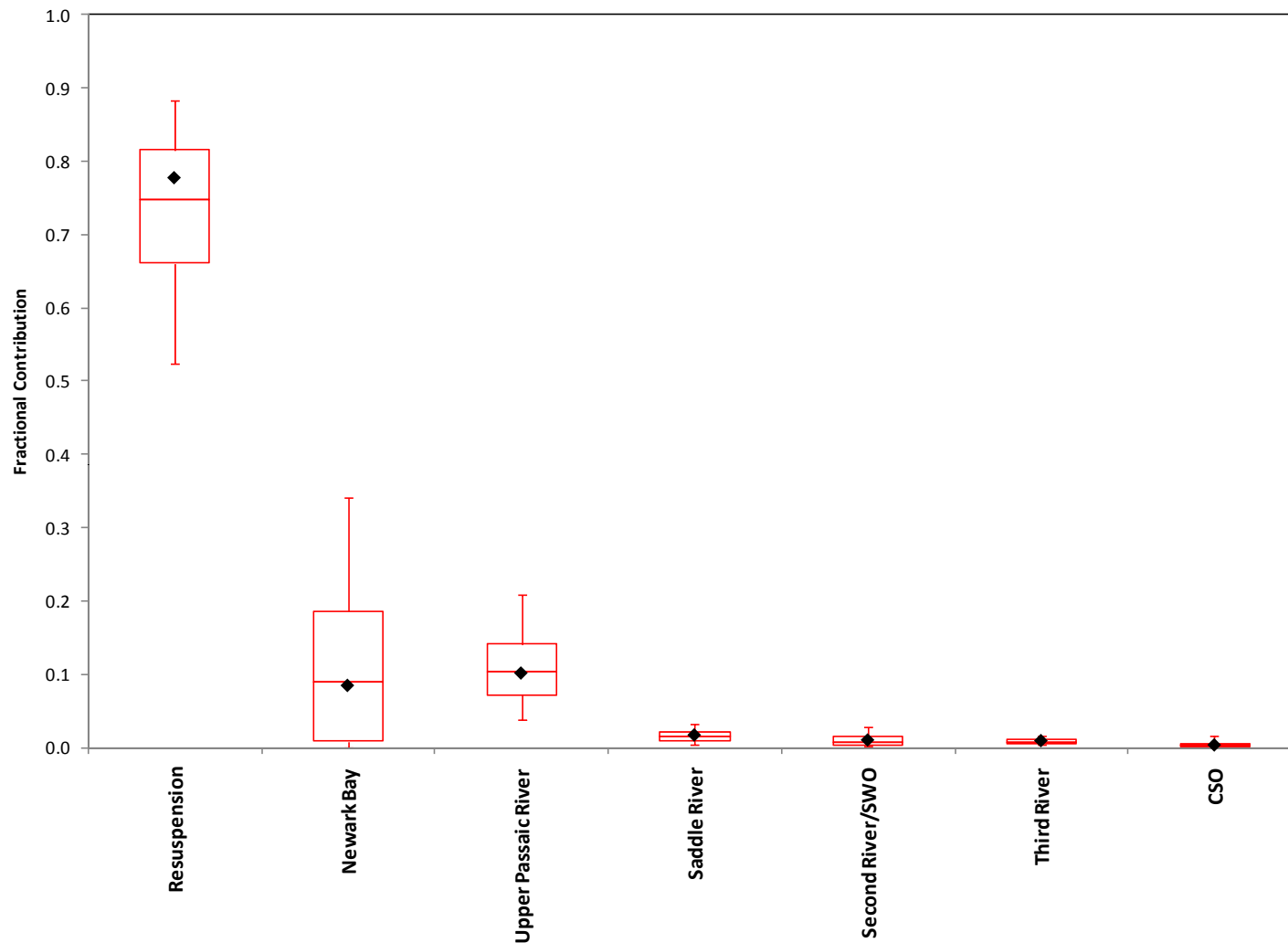


Source Concentration and Mass Balance for 4,4'-DDE

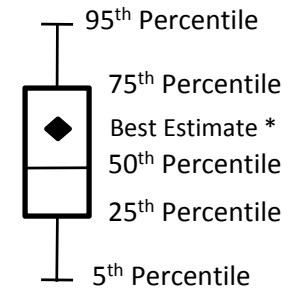
Lower Passaic River Restoration Project

Figure 19-9A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



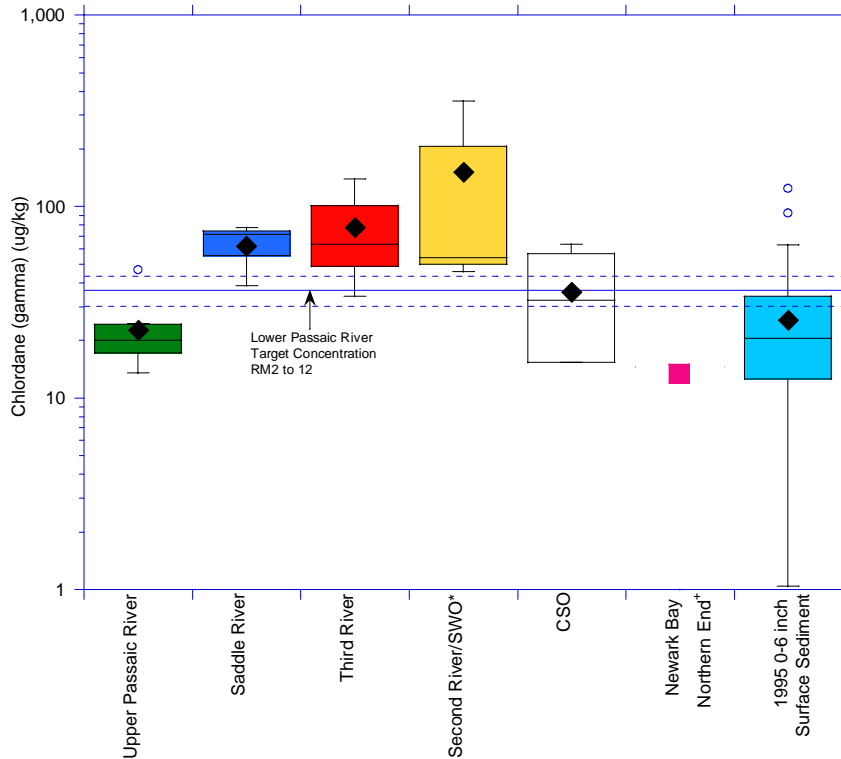
Fractional Contribution for 4,4'-DDE  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

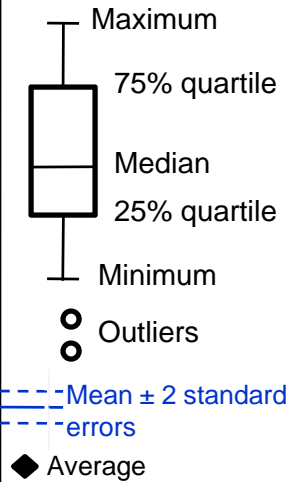
Figure 19-9B

2009

### Source Concentration of Chlordane (gamma, trans)



### Legend

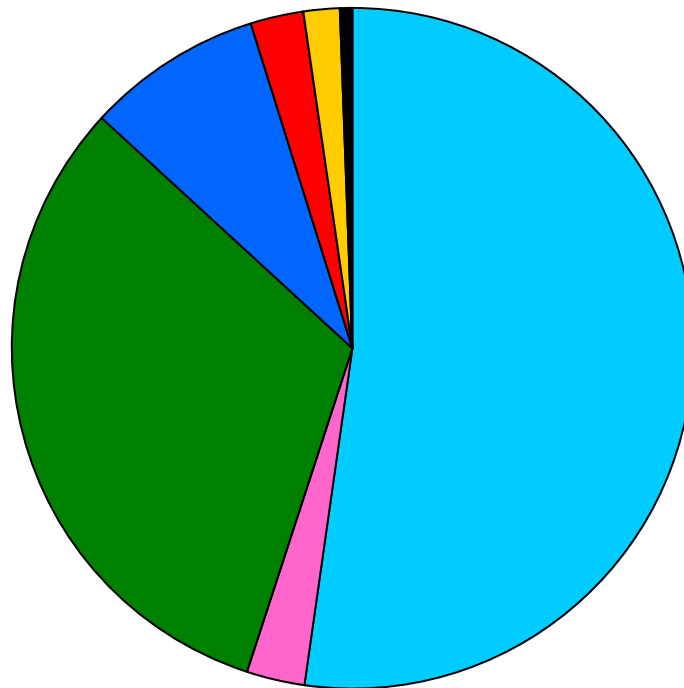


### Notes

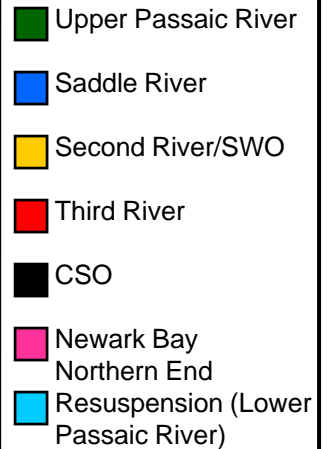
\*Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

+Robinson (2002)

### Best Estimate Mass Balance for Chlordane (gamma)



### Legend

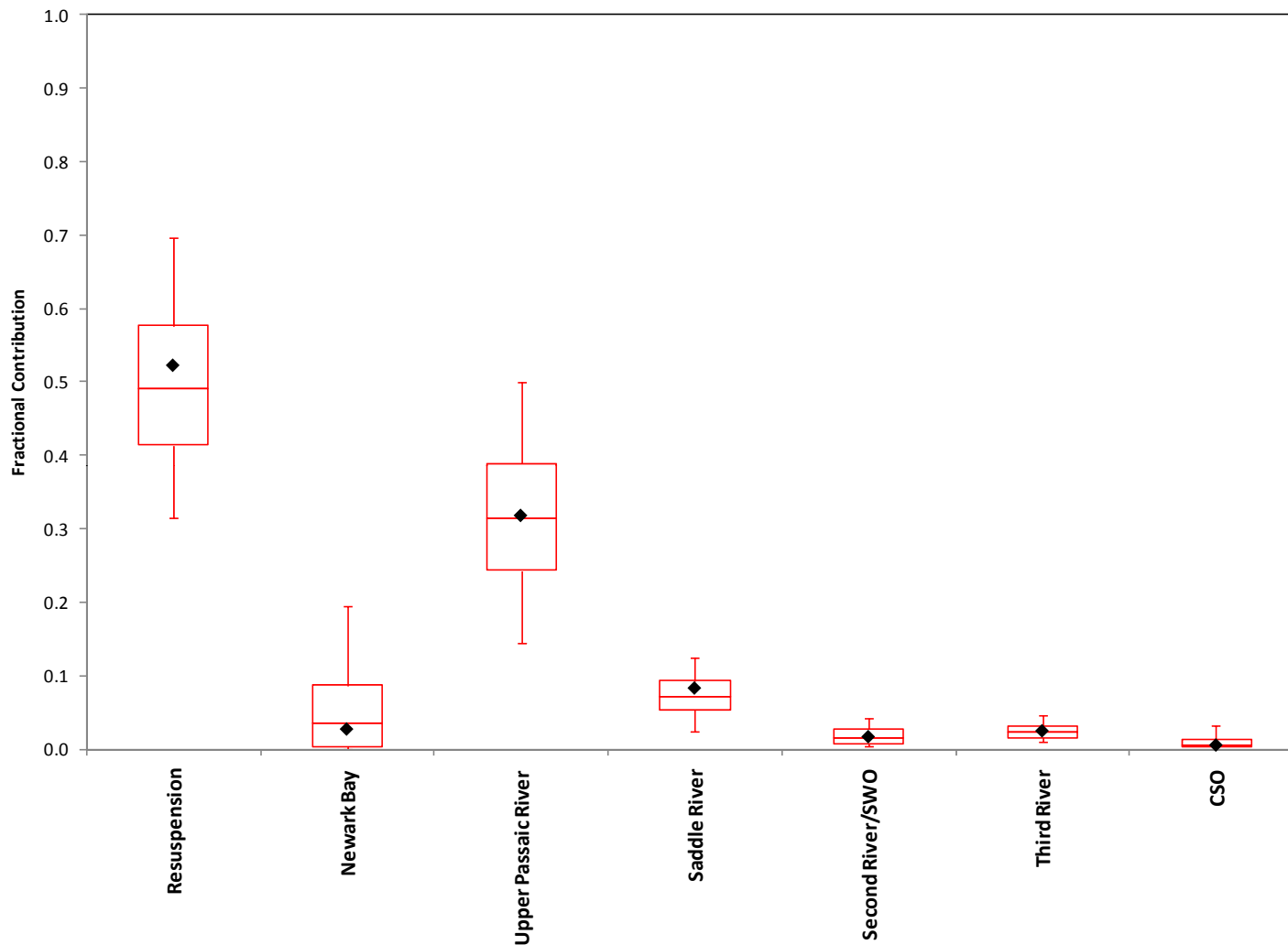


Source Concentration and Mass Balance for Chlordane (gamma)

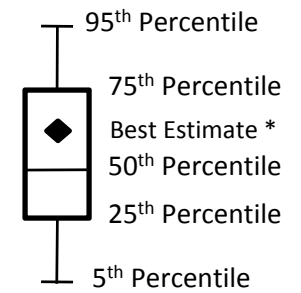
Lower Passaic River Restoration Project

Figure 19-10A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



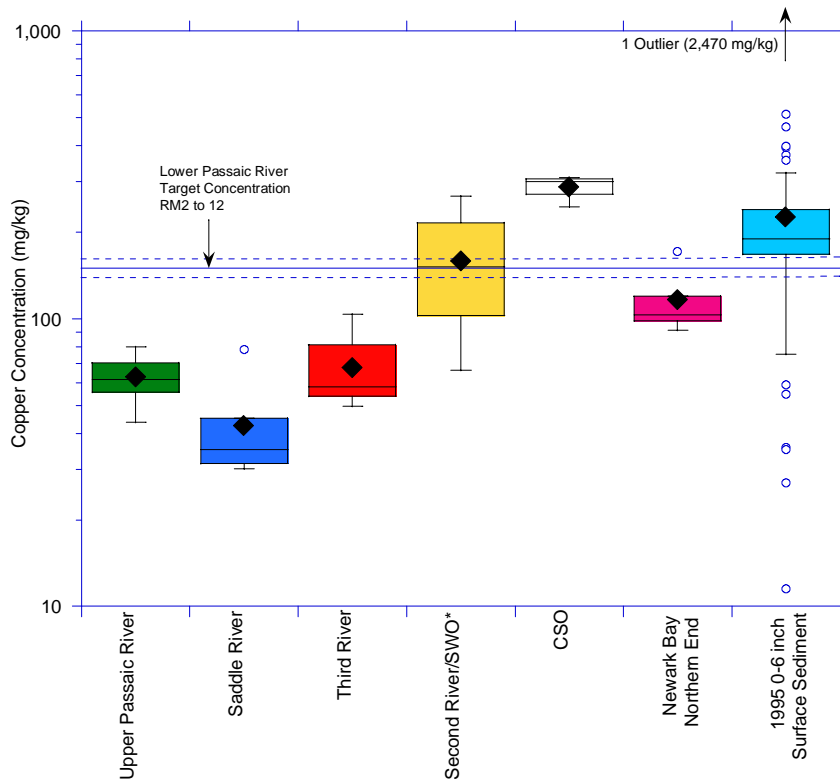
Fractional Contribution for Chlordane (gamma)  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

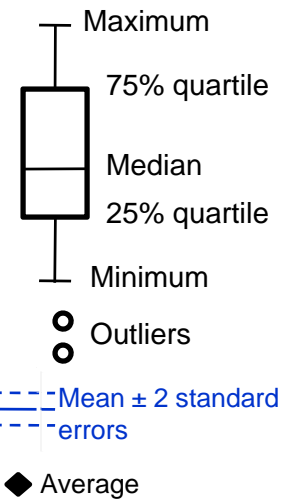
Figure 19-10B

2009

## Source Concentration of Copper



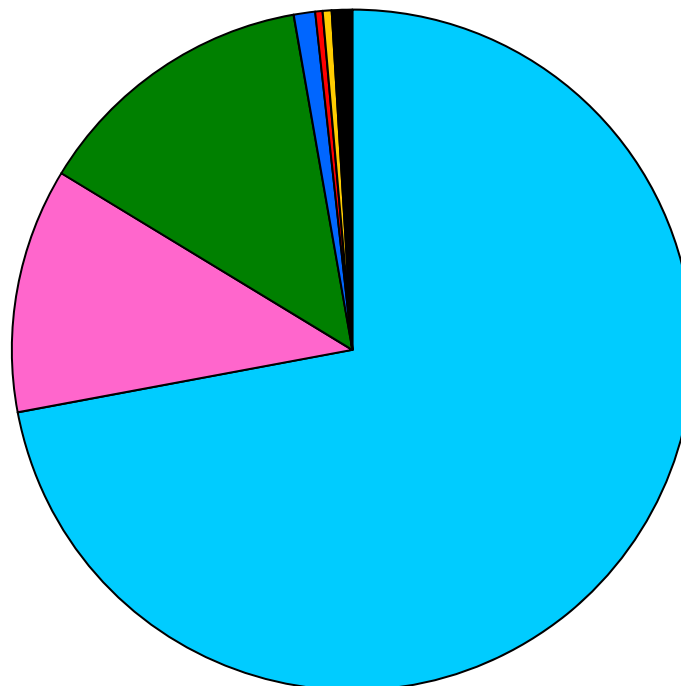
### Legend



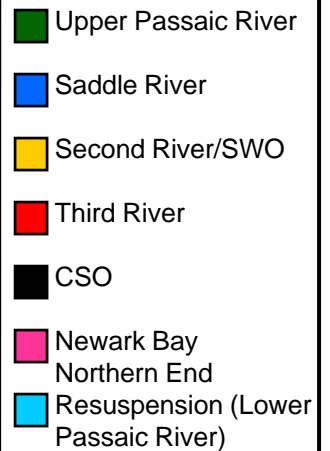
### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

## Best Estimate Mass Balance for Copper



### Legend

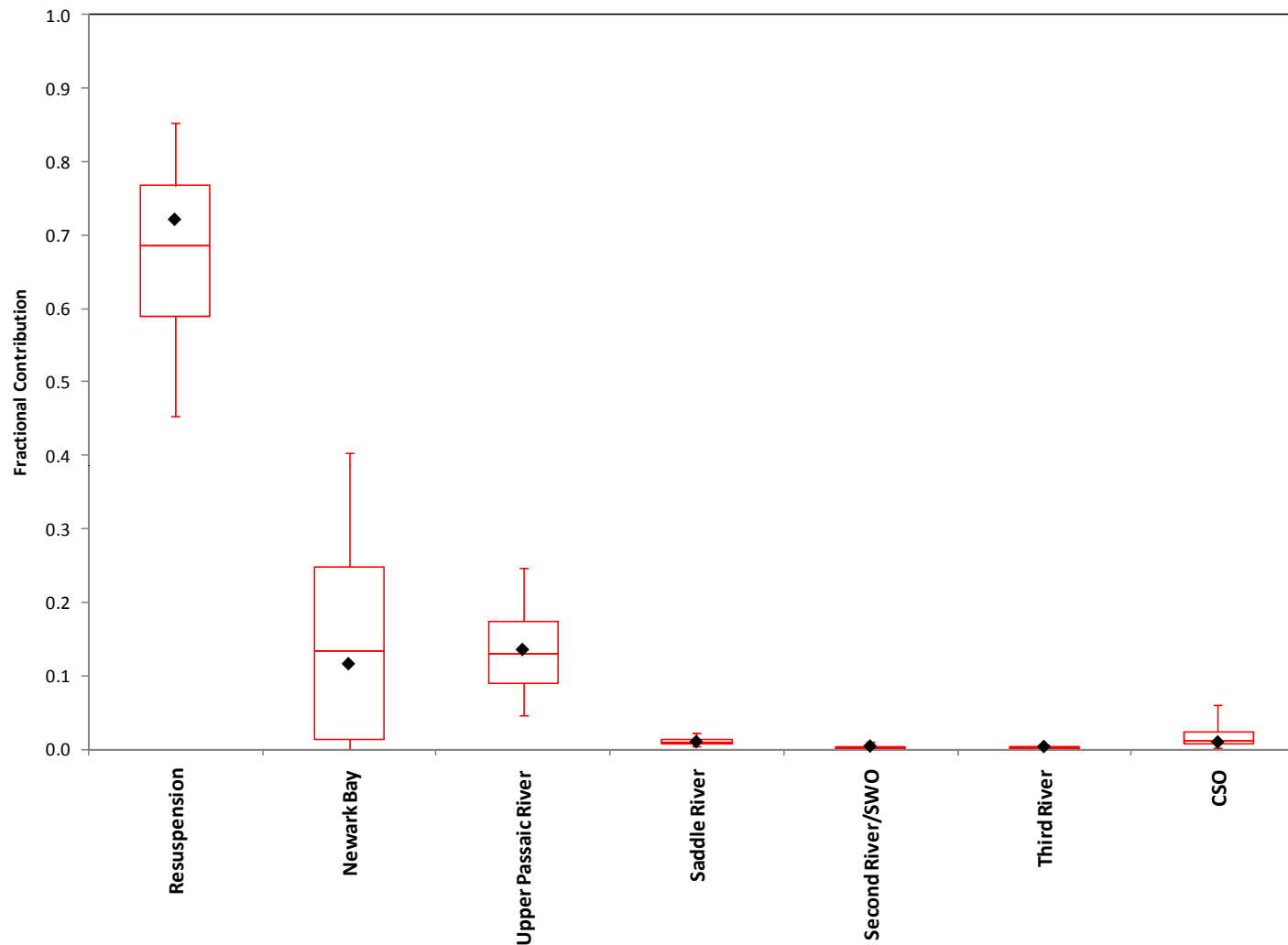


## Source Concentration and Mass Balance for Copper

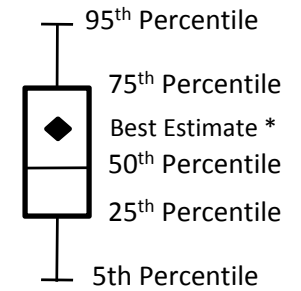
Lower Passaic River Restoration Project

Figure 19-11A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



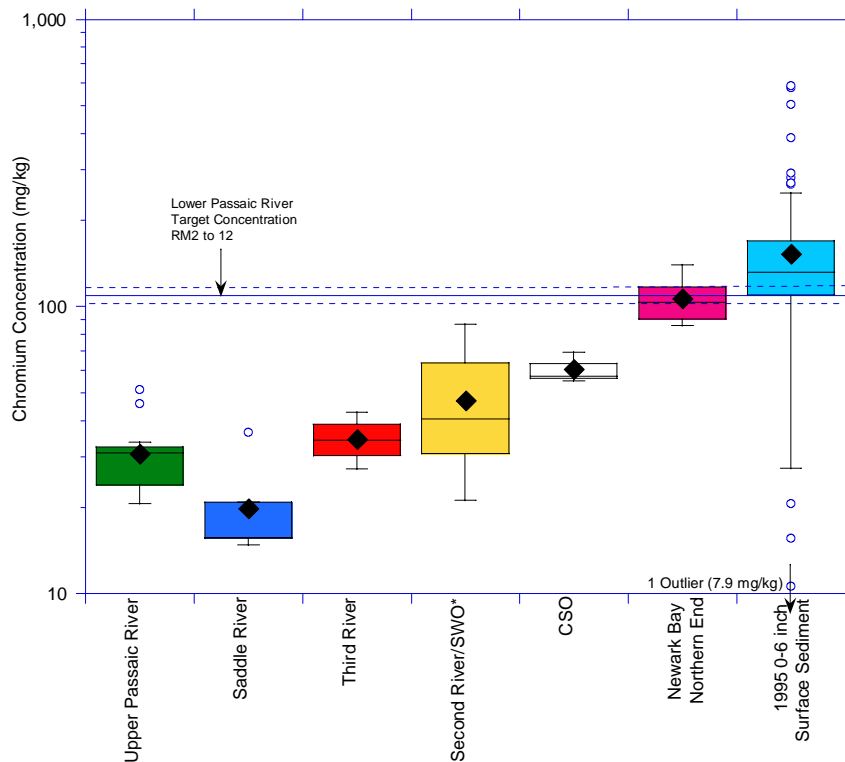
Fractional Contribution for Copper  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

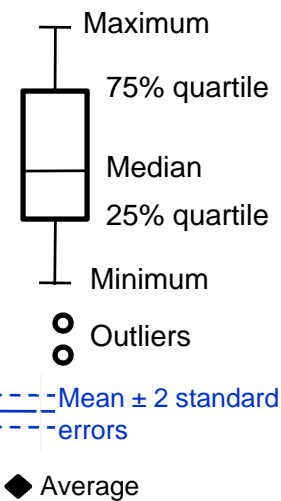
Figure 19-11B

2009

## Source Concentration of Chromium



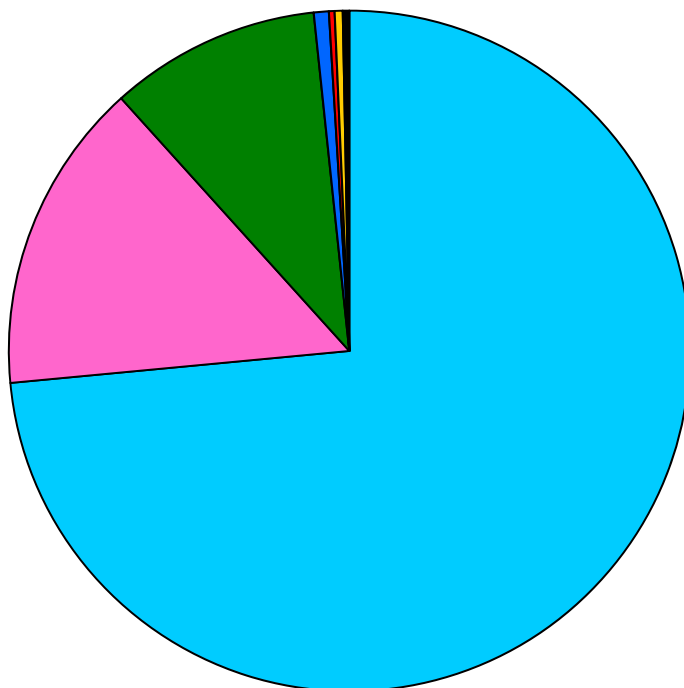
## Legend



## Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

## Best Estimate Mass Balance for Chromium



## Legend

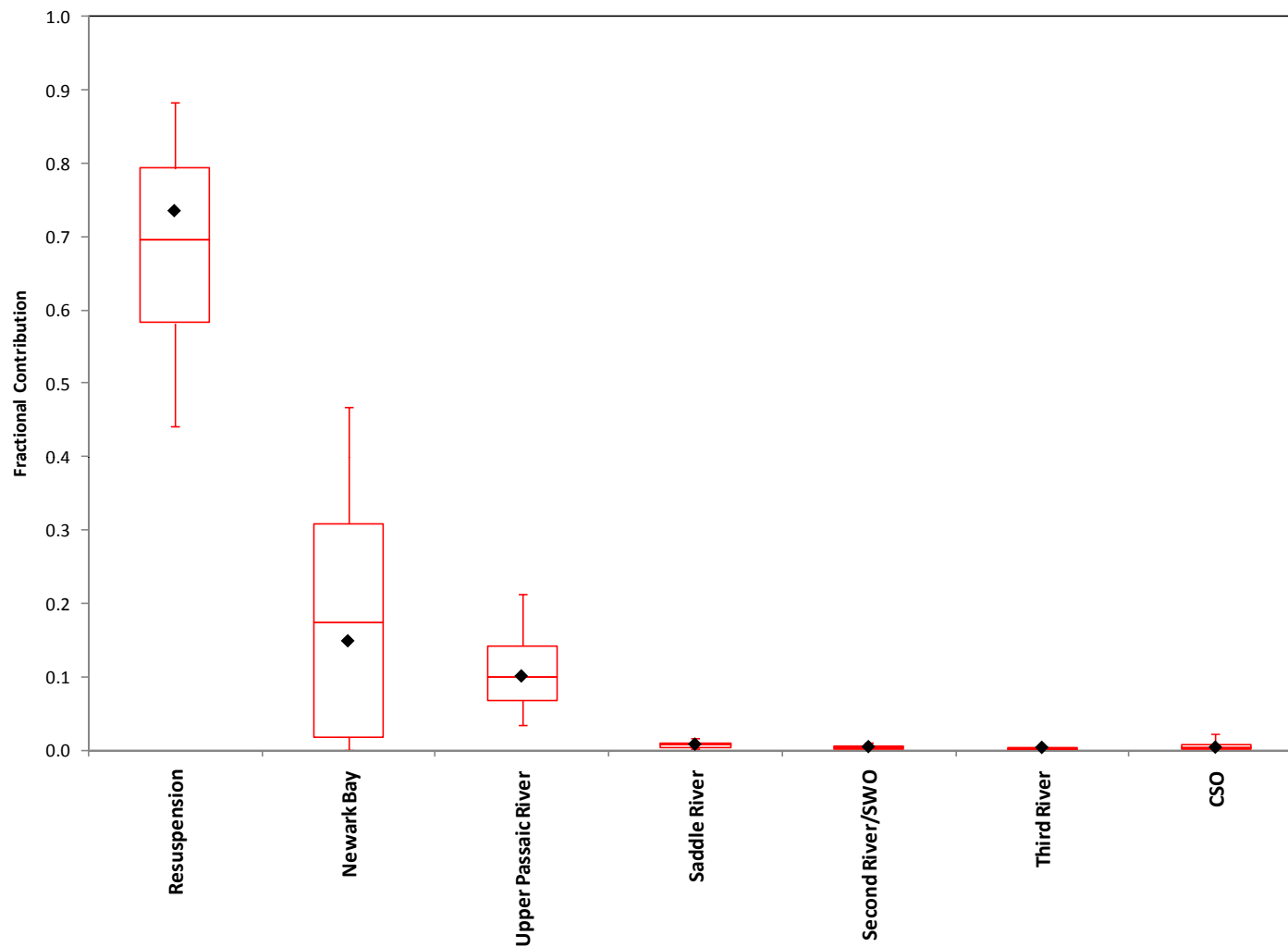


Source Concentration and Mass Balance for Chromium

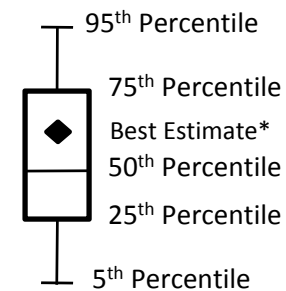
Lower Passaic River Restoration Project

Figure 19-12A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



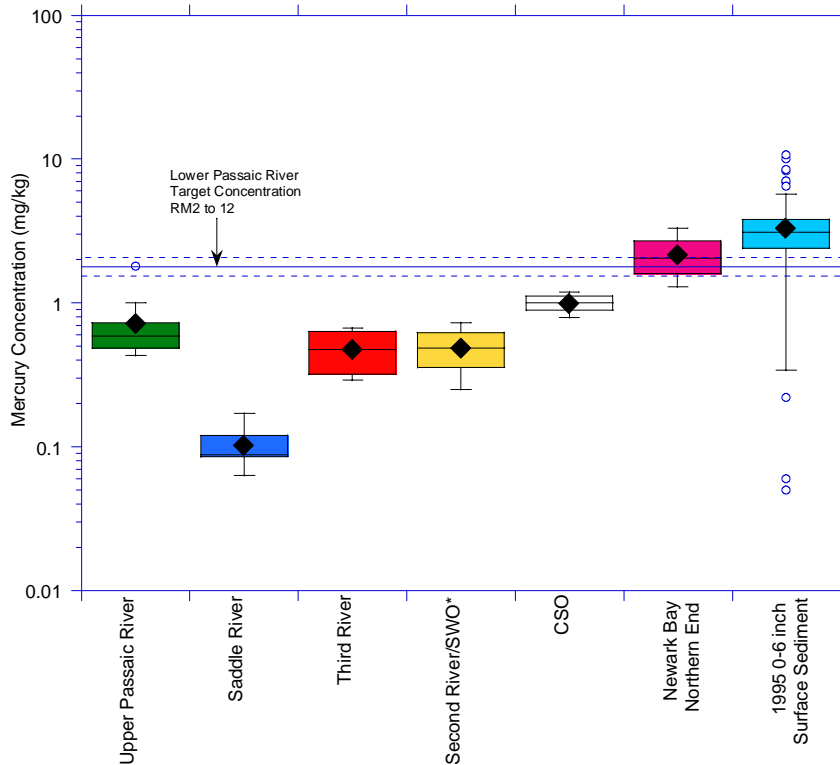
Fractional Contribution for Chromium  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

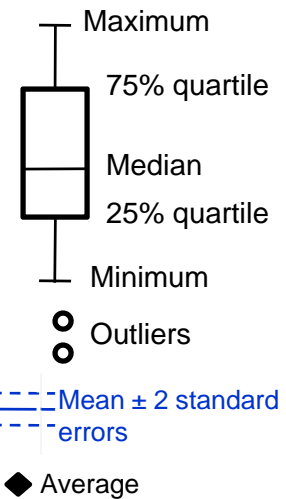
Figure 19-12B

2009

## Source Concentration of Mercury



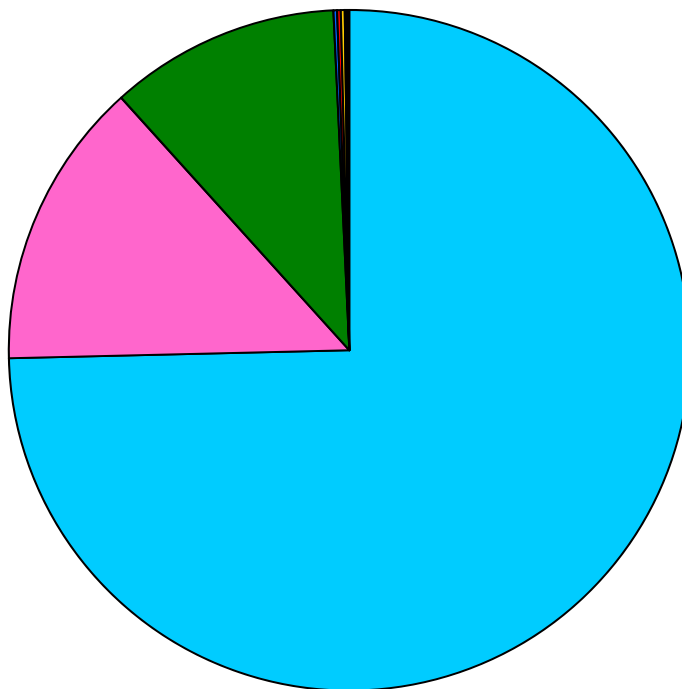
## Legend



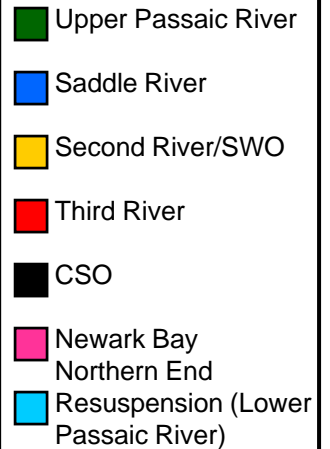
## Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

## Best Estimate Mass Balance for Mercury



## Legend

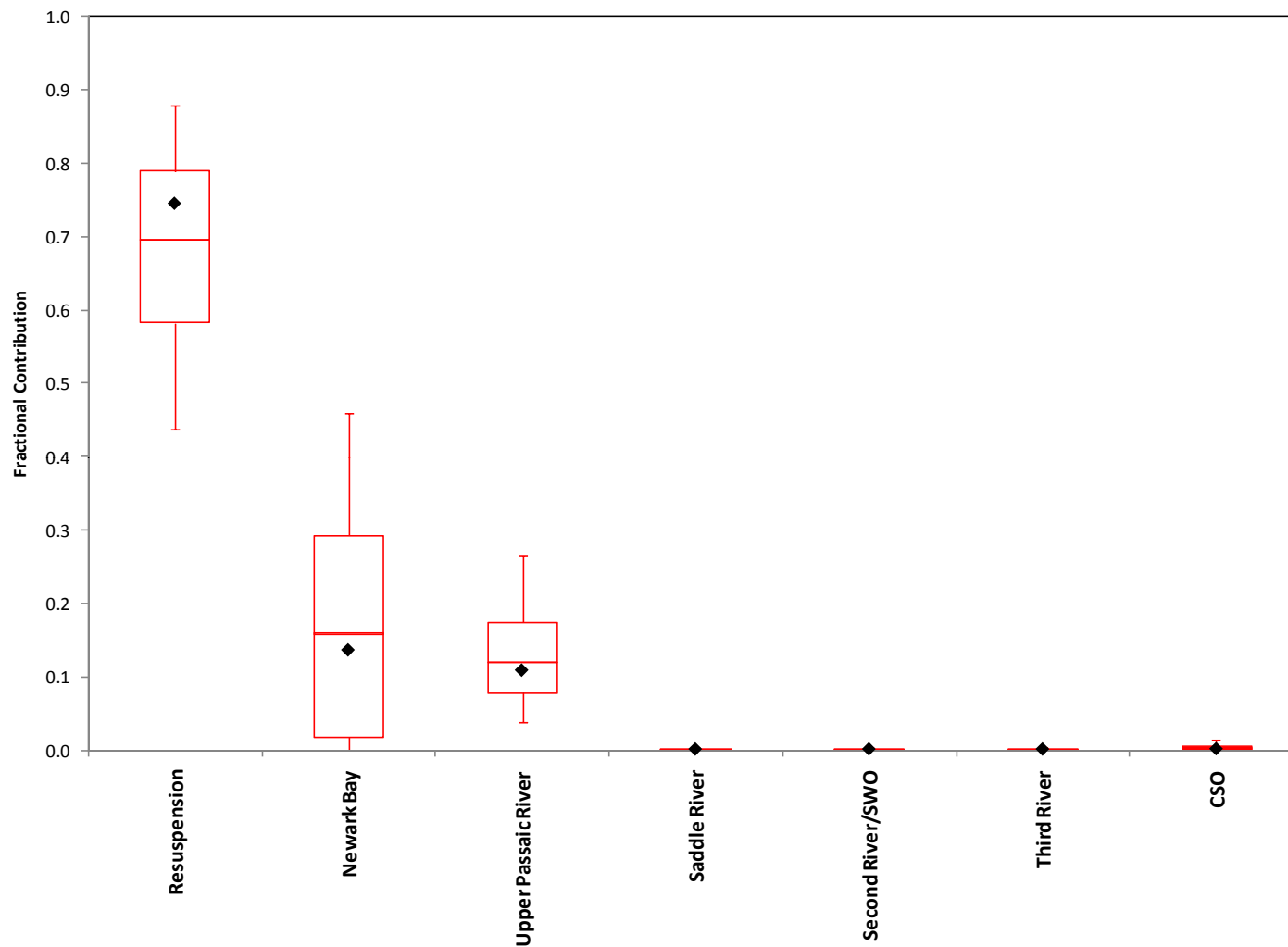


Source Concentration and Mass Balance for Mercury

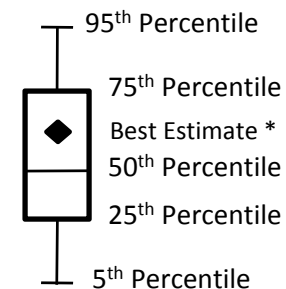
Lower Passaic River Restoration Project

Figure 19-13A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



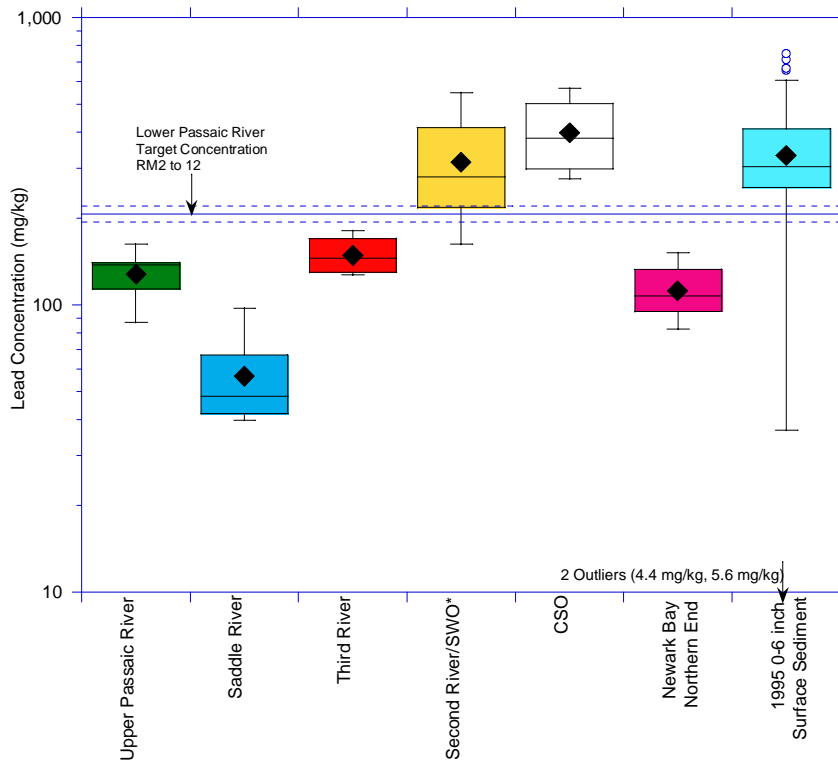
Fractional Contribution for Mercury  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

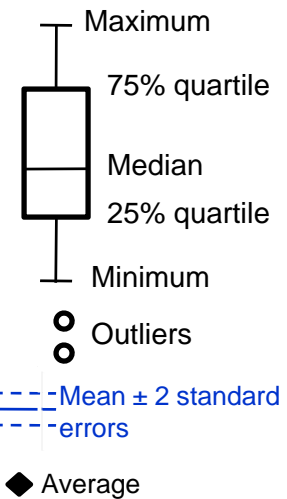
Figure 19-13B

2009

## Source Concentration of Lead



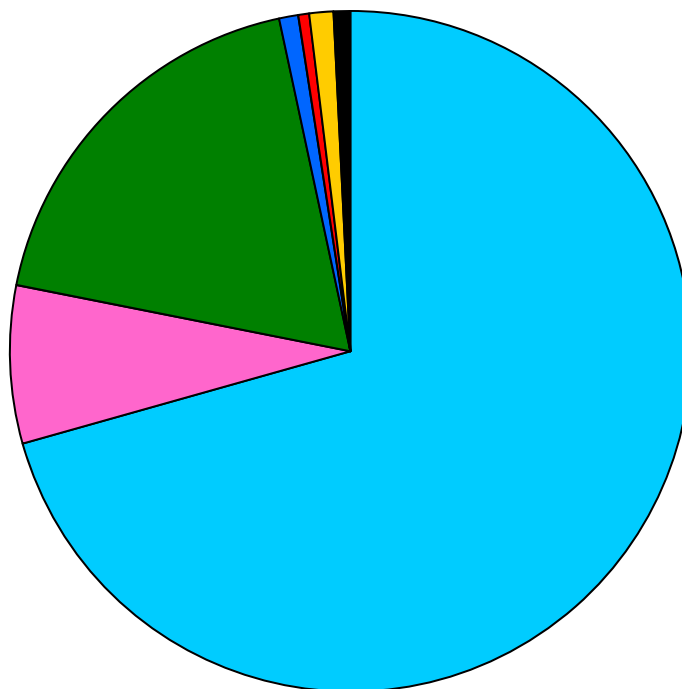
## Legend



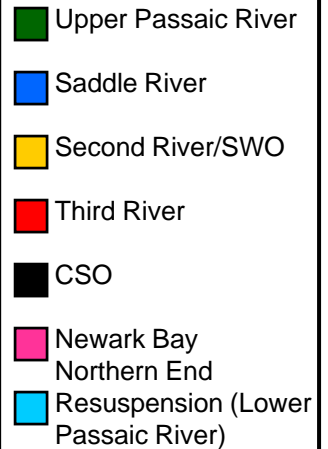
## Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

## Best Estimate Mass Balance for Lead



## Legend

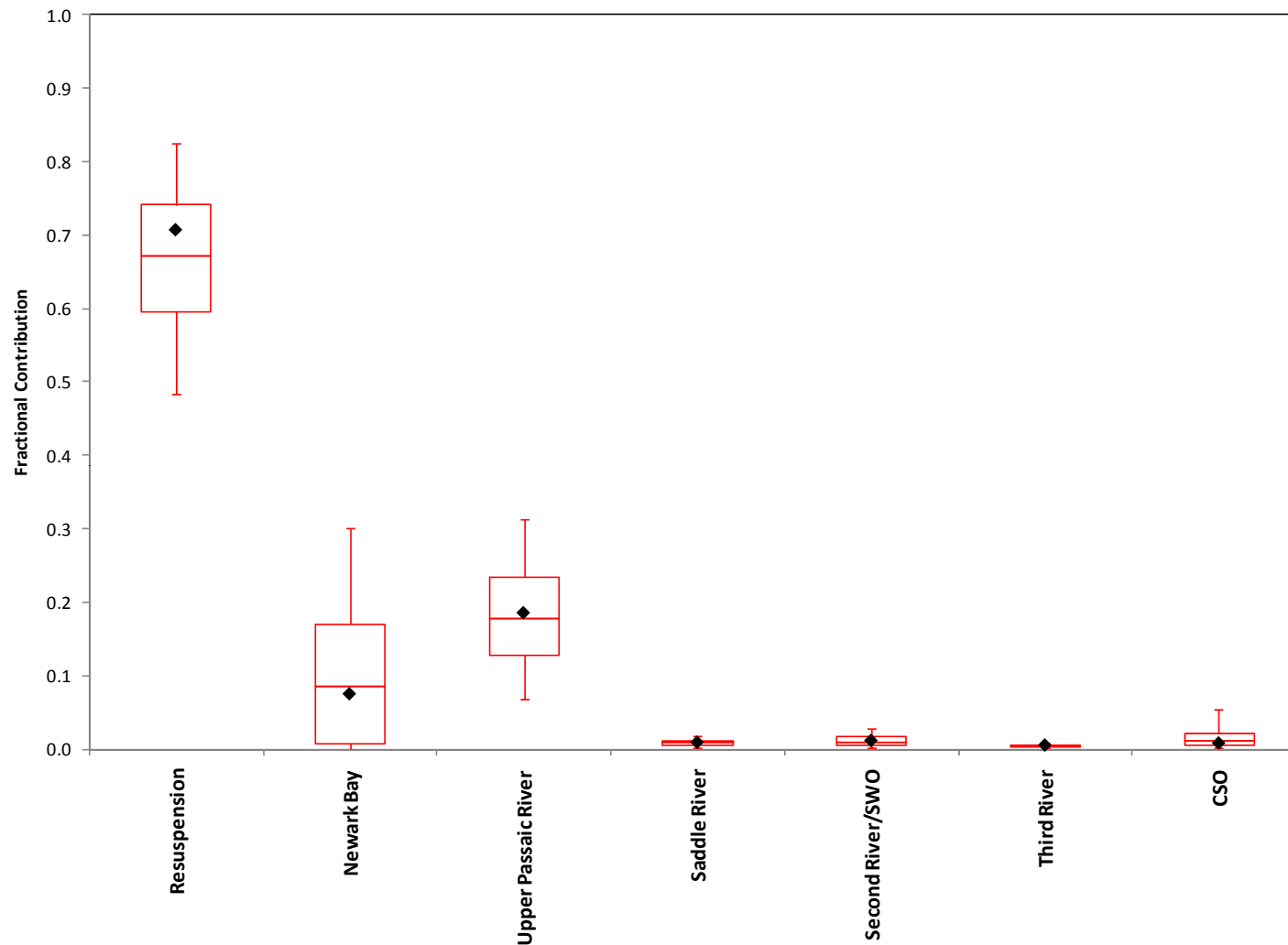


Source Concentration and Mass Balance for Lead

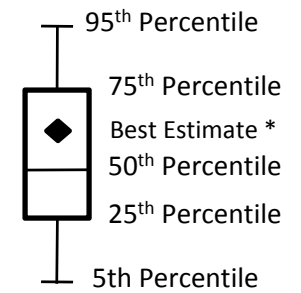
Lower Passaic River Restoration Project

Figure 19-14A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



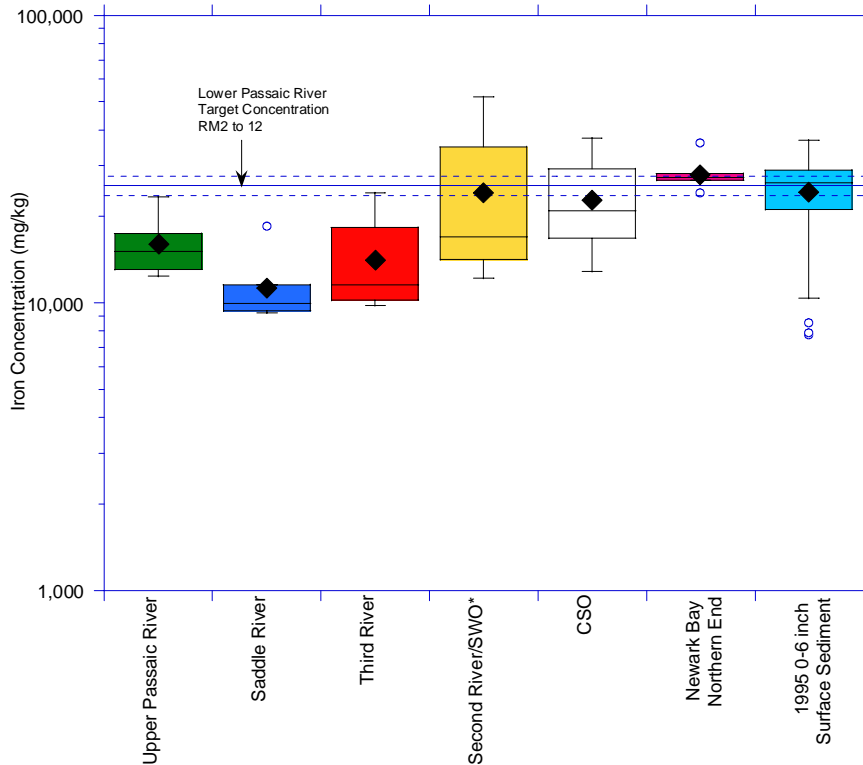
Fractional Contribution for Lead  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

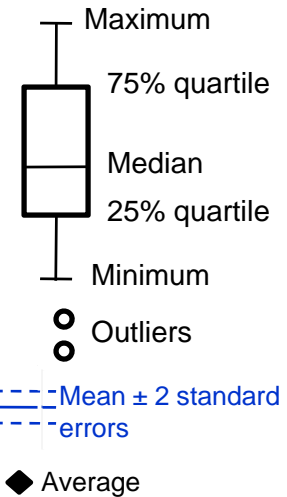
Figure 19-14B

2009

### Source Concentration of Iron



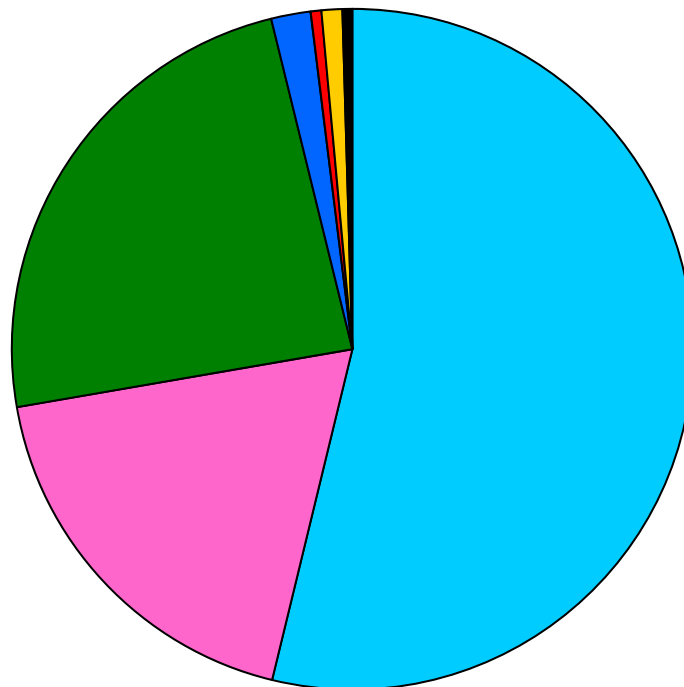
### Legend



### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

### Best Estimate Mass Balance for Iron



### Legend

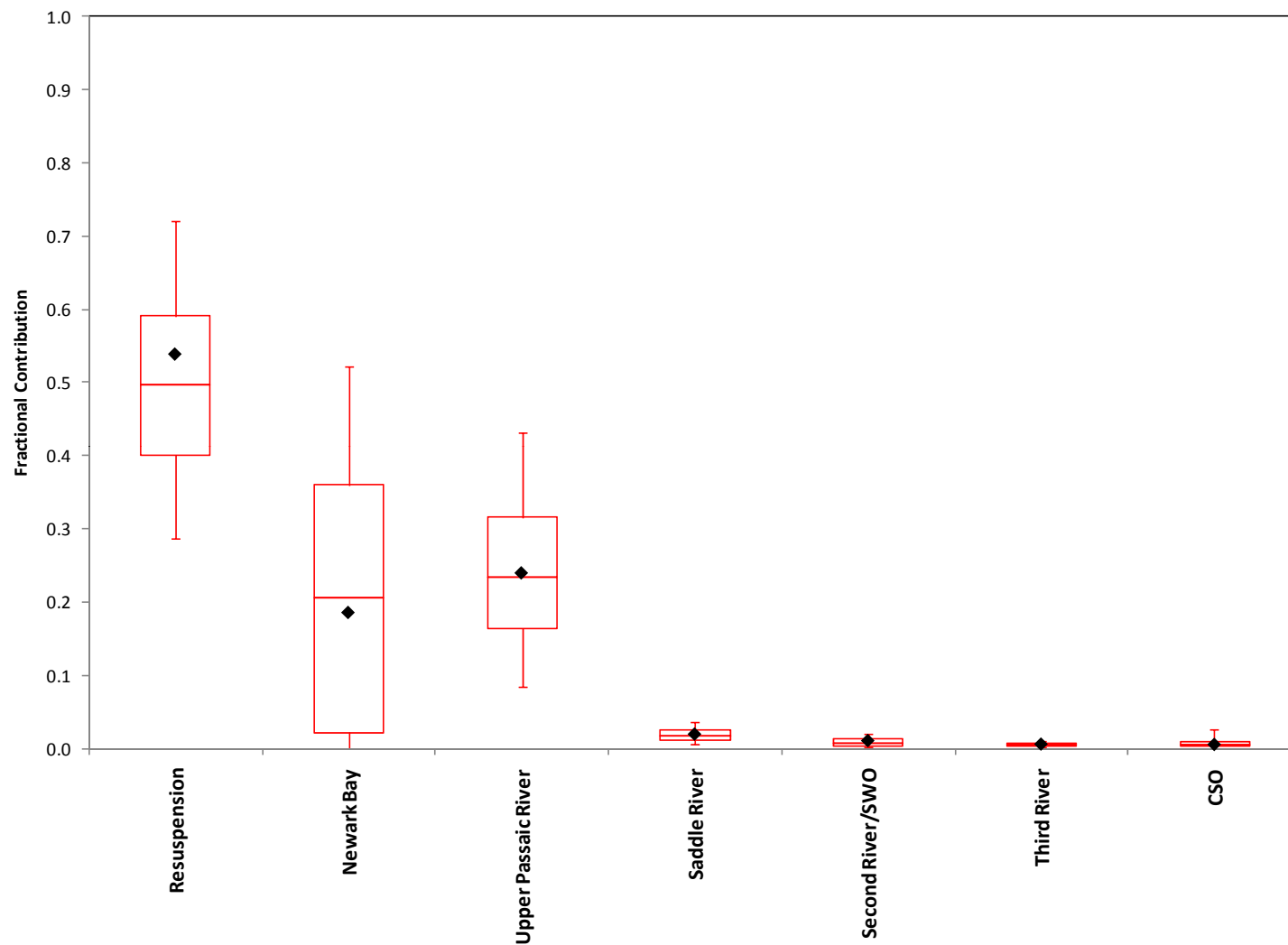


Source Concentration and Mass Balance for Iron

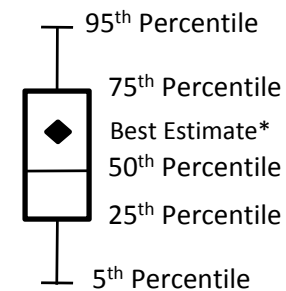
Lower Passaic River Restoration Project

Figure 19-15A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.



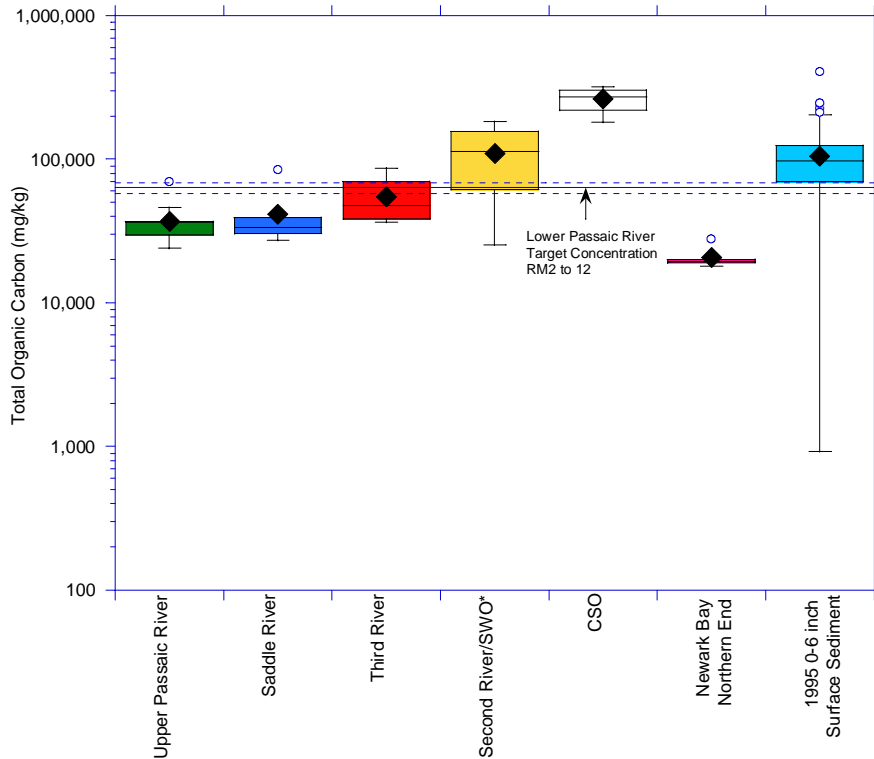
Fractional Contribution for Iron  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

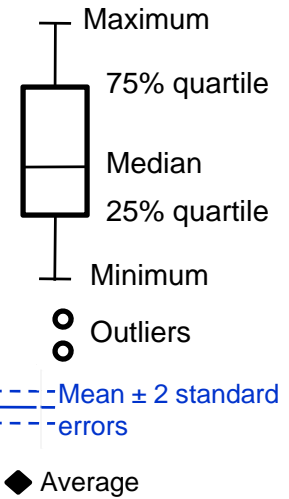
Figure 19-15B

2009

### Source Concentration of Total Organic Carbon



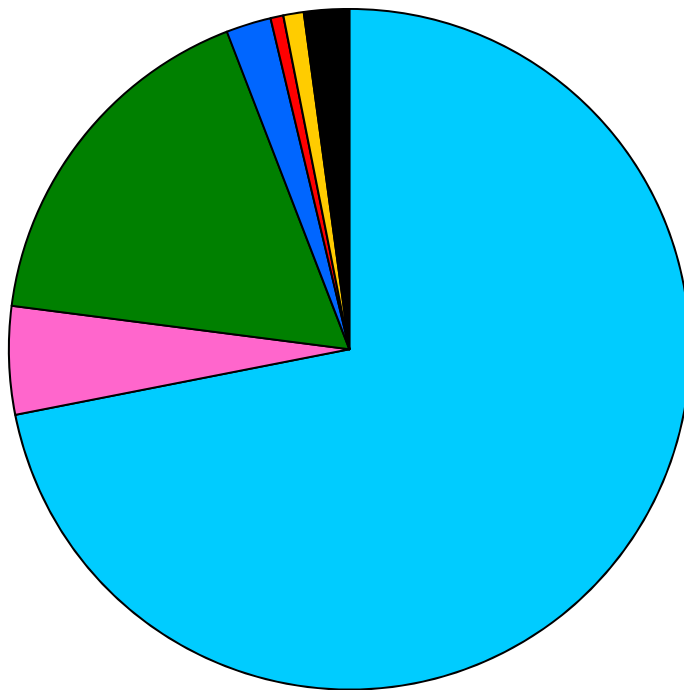
### Legend



### Notes

\*: Second River Results are used to represent the SWOs. (see Chapter 18 for explanation)

### Best Estimate Mass Balance for Total Organic Carbon



### Legend

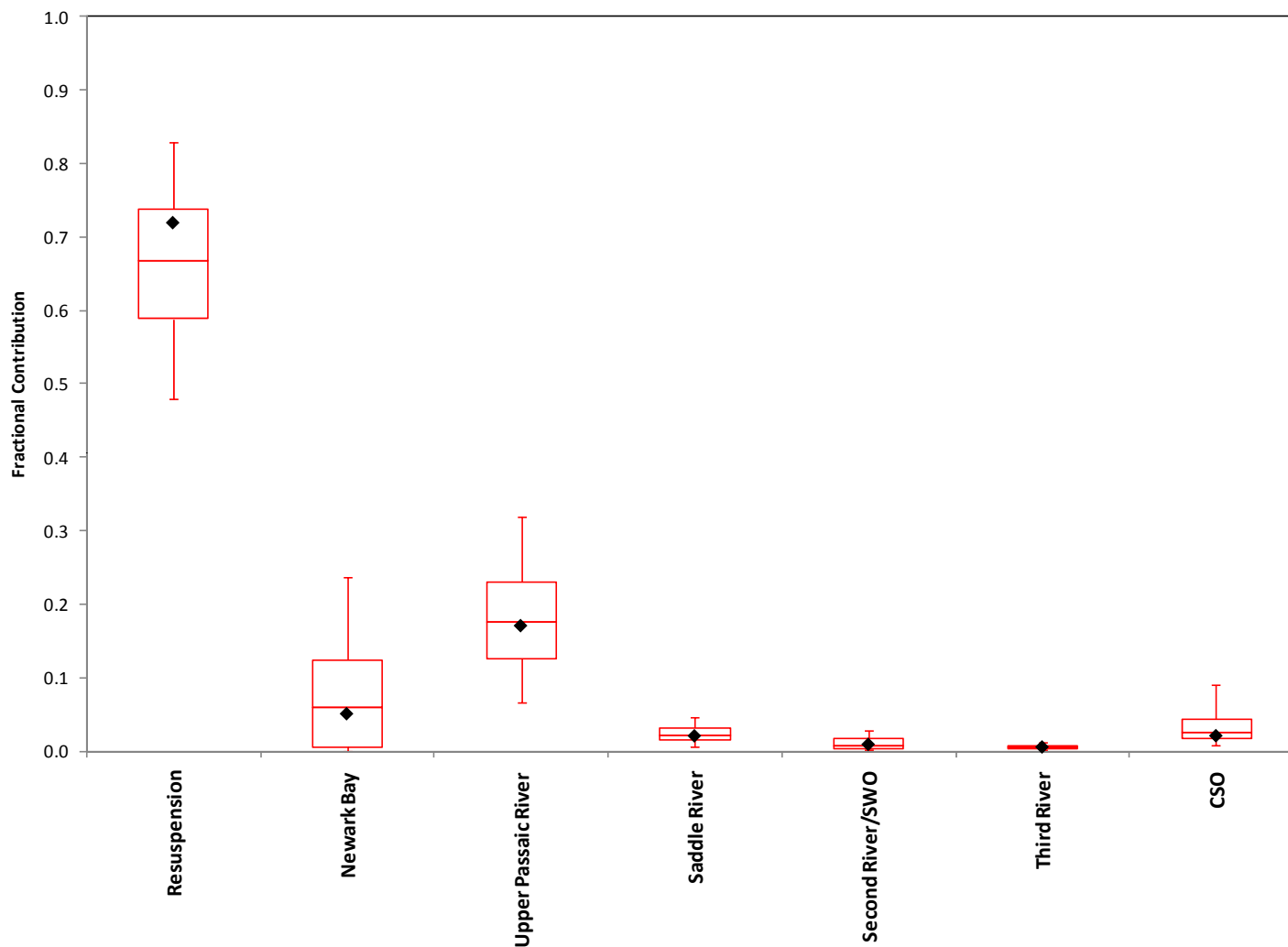


Source Concentration and Mass Balance for Total Organic Carbon

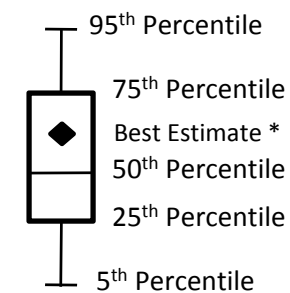
Lower Passaic River Restoration Project

Figure 19-16A

2009



### Legend



### Notes:

\*: Best Estimate represents Mass Balance estimates using average input values for source profiles.

5<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 95<sup>th</sup> percentiles are based on Mass Balance results for the 10,000 iterations in Monte Carlo Analysis.

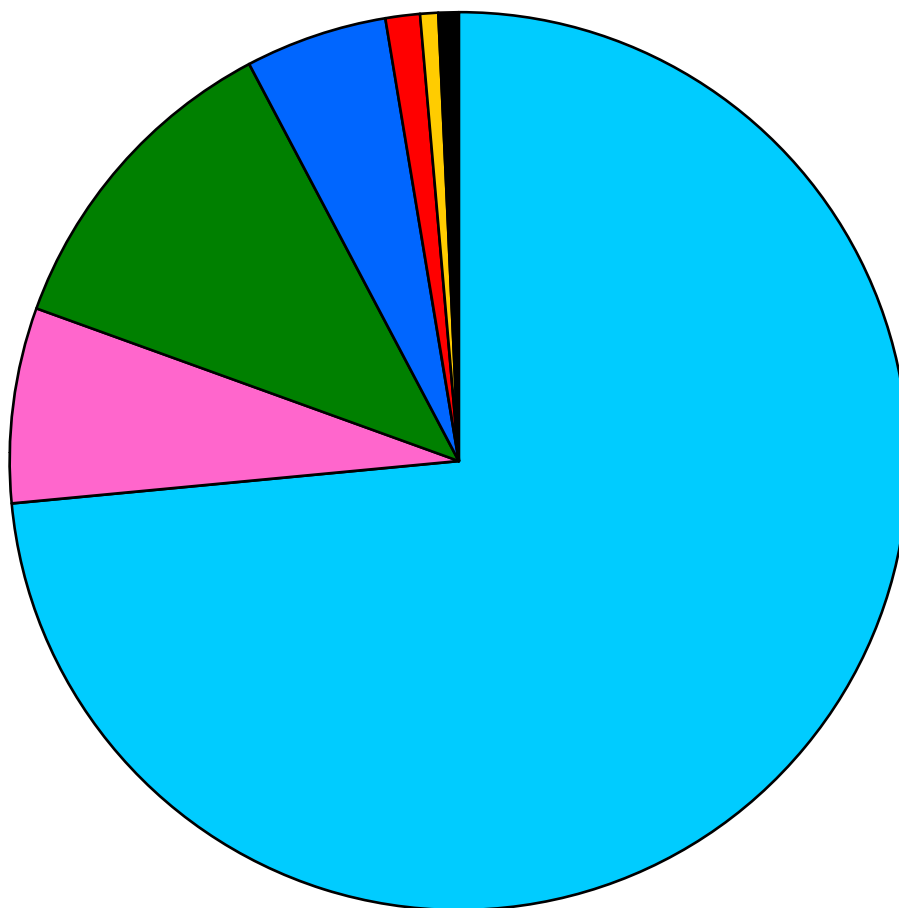


Fractional Contribution for Total Organic Carbon  
(Results from Monte Carlo Analysis and Best Estimate Solution)

*Lower Passaic River Restoration Project*

Figure 19-16B

2009



### Legend

- Upper Passaic River
- Saddle River
- Second River/SWO
- Third River
- CSO
- Newark Bay Northern End
- Resuspension (Lower Passaic River)

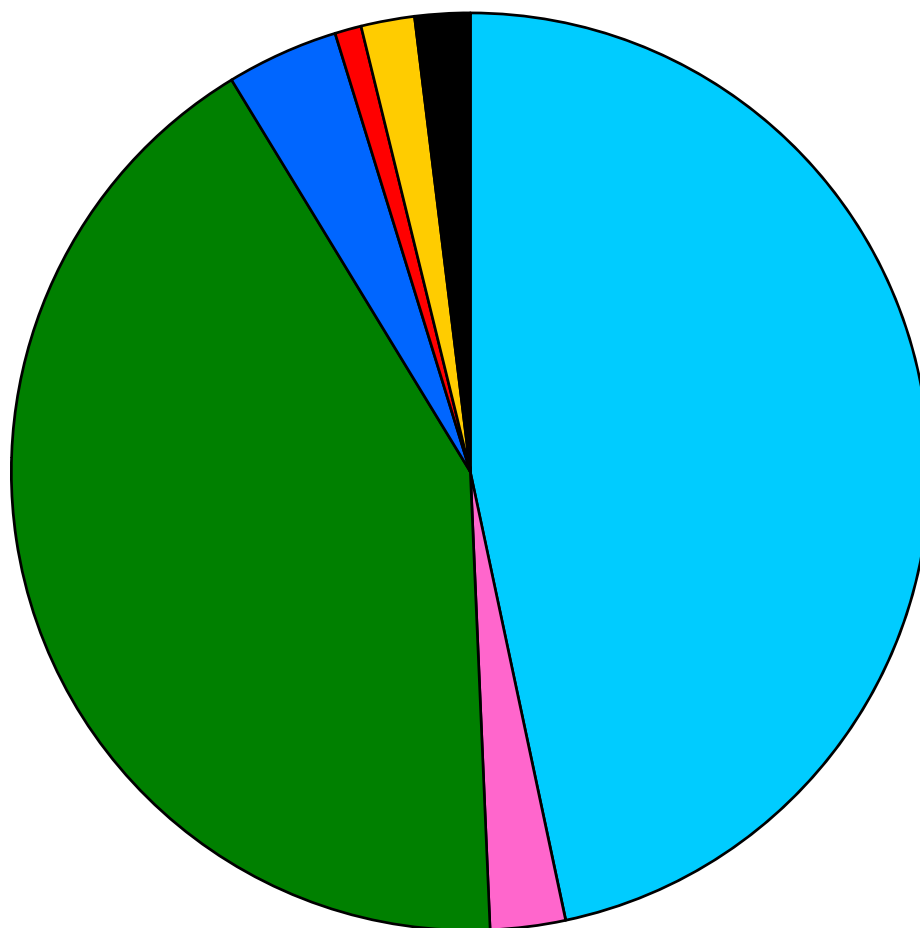


Dieldrin Contribution to the Lower Passaic River

*Lower Passaic River Restoration Project*

Figure 19-17

2009



### Legend

- Upper Passaic River
- Saddle River
- Second River/SWO
- Third River
- CSO
- Newark Bay Northern End
- Resuspension (Lower Passaic River)



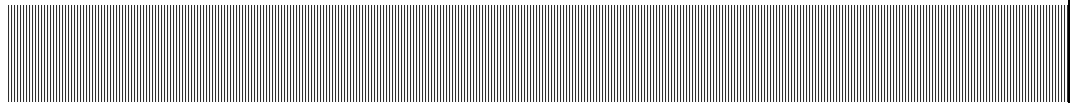
Phenanthrene Contribution to the Lower Passaic River

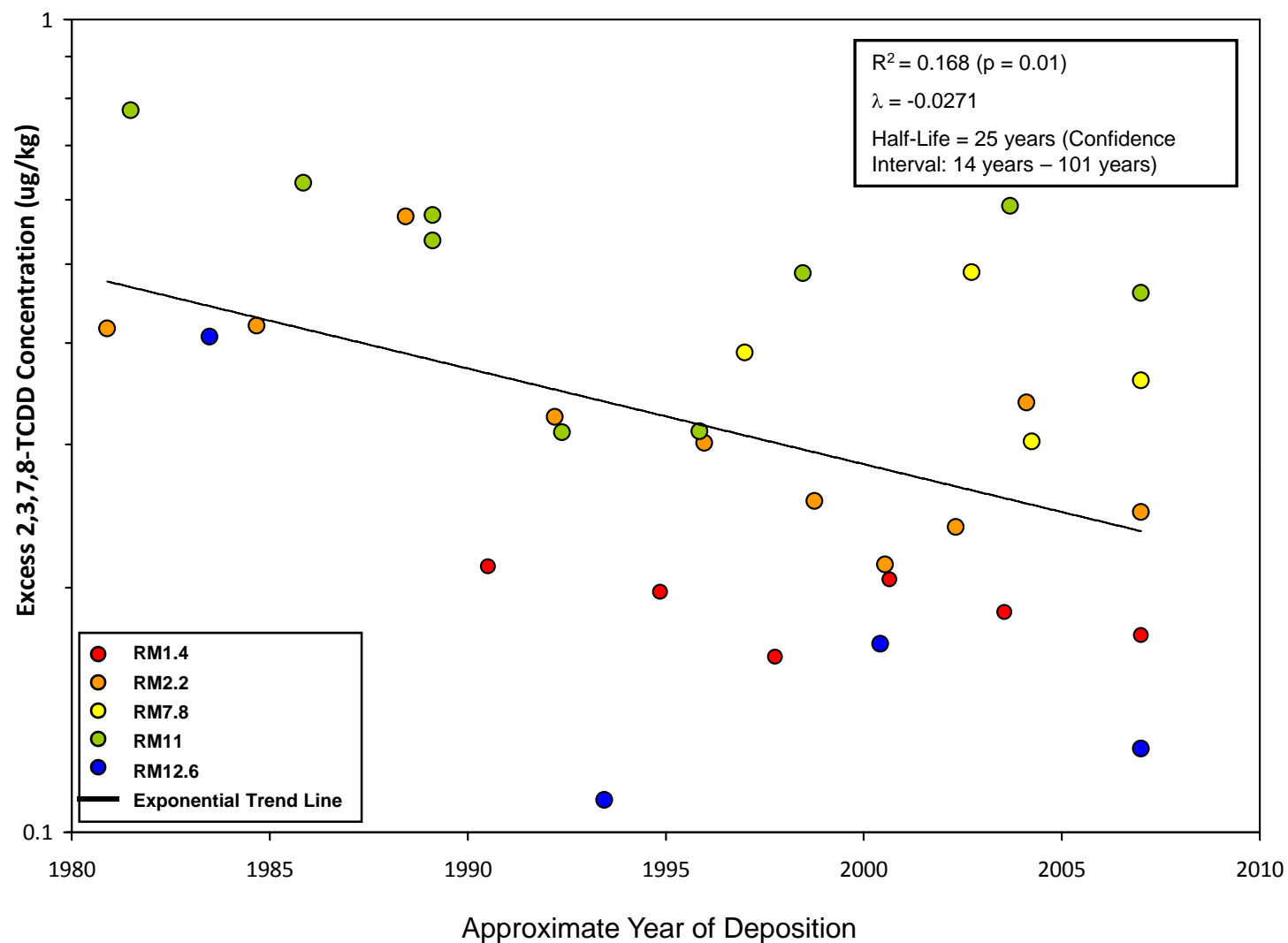
*Lower Passaic River Restoration Project*

Figure 19-18

2009

## Chapter 20 Figures





Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

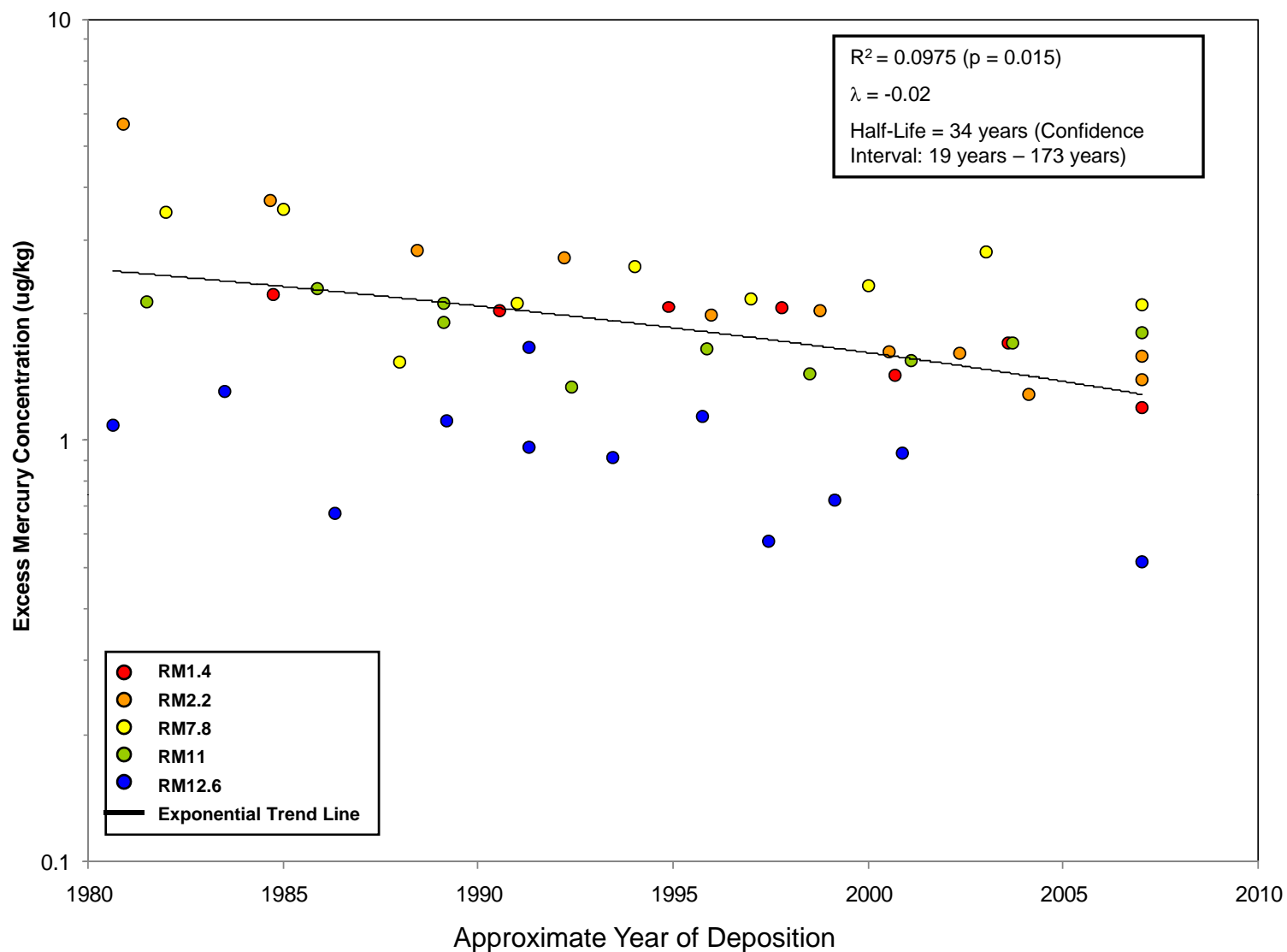


Excess 2,3,7,8-TCDD Concentration vs. Approximate Year of Deposition

Lower Passaic River Restoration Project

Figure 20-1

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

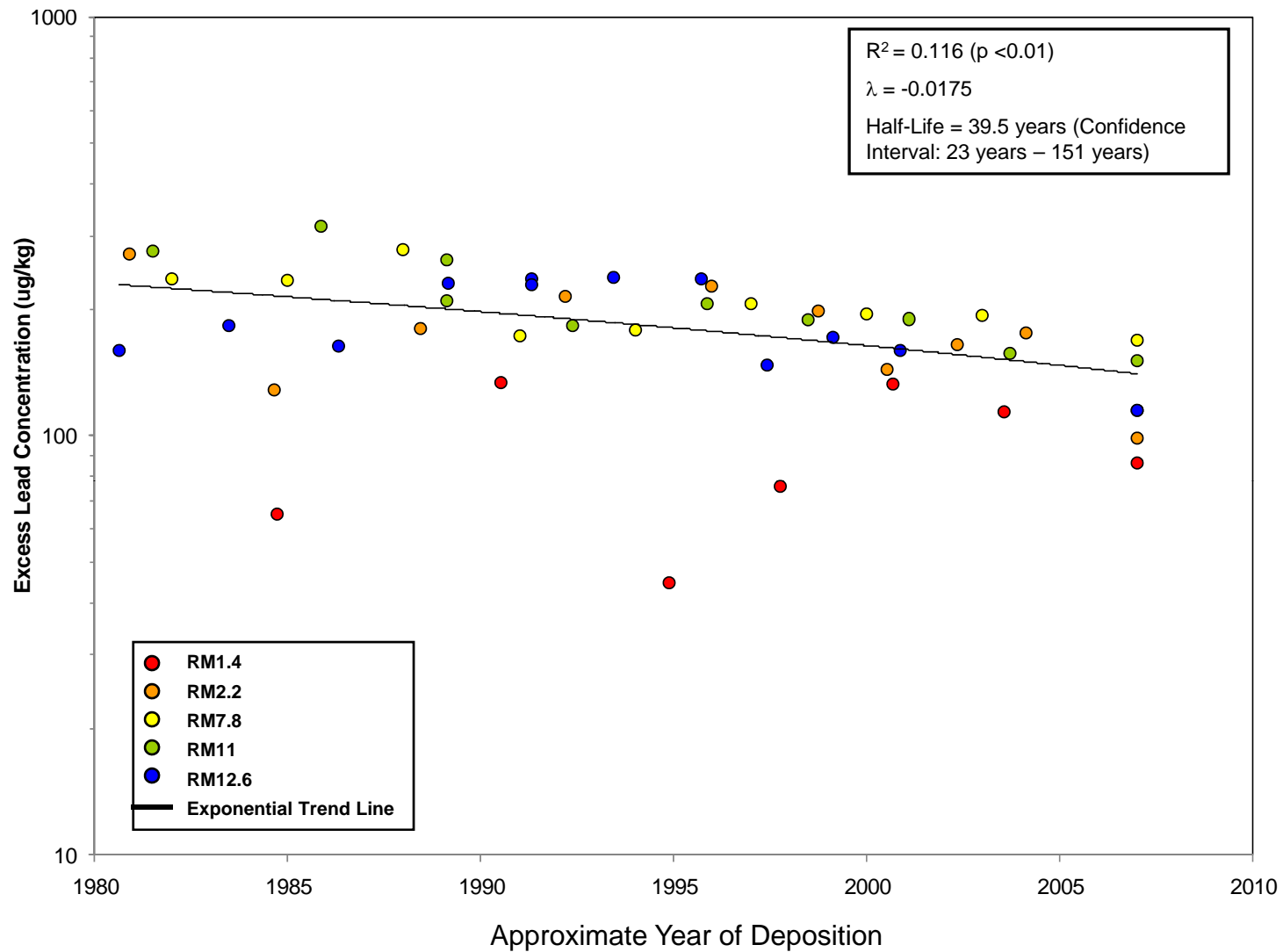


Excess Mercury Concentration vs. Approximate Year of Deposition

Figure 20-2

Lower Passaic River Restoration Project

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

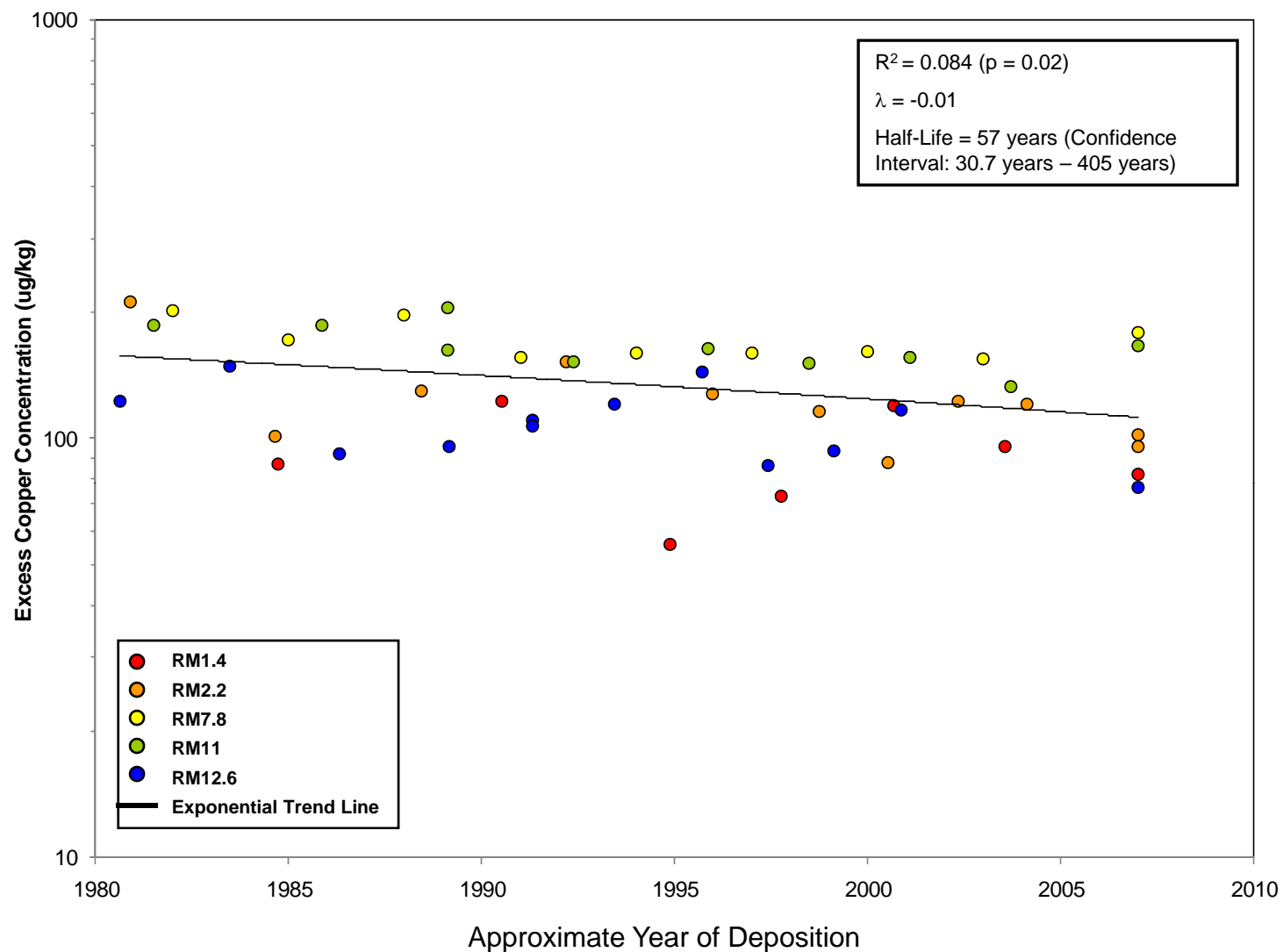


Excess Lead Concentration vs. Approximate Year of Deposition

Lower Passaic River Restoration Project

Figure 20-3

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

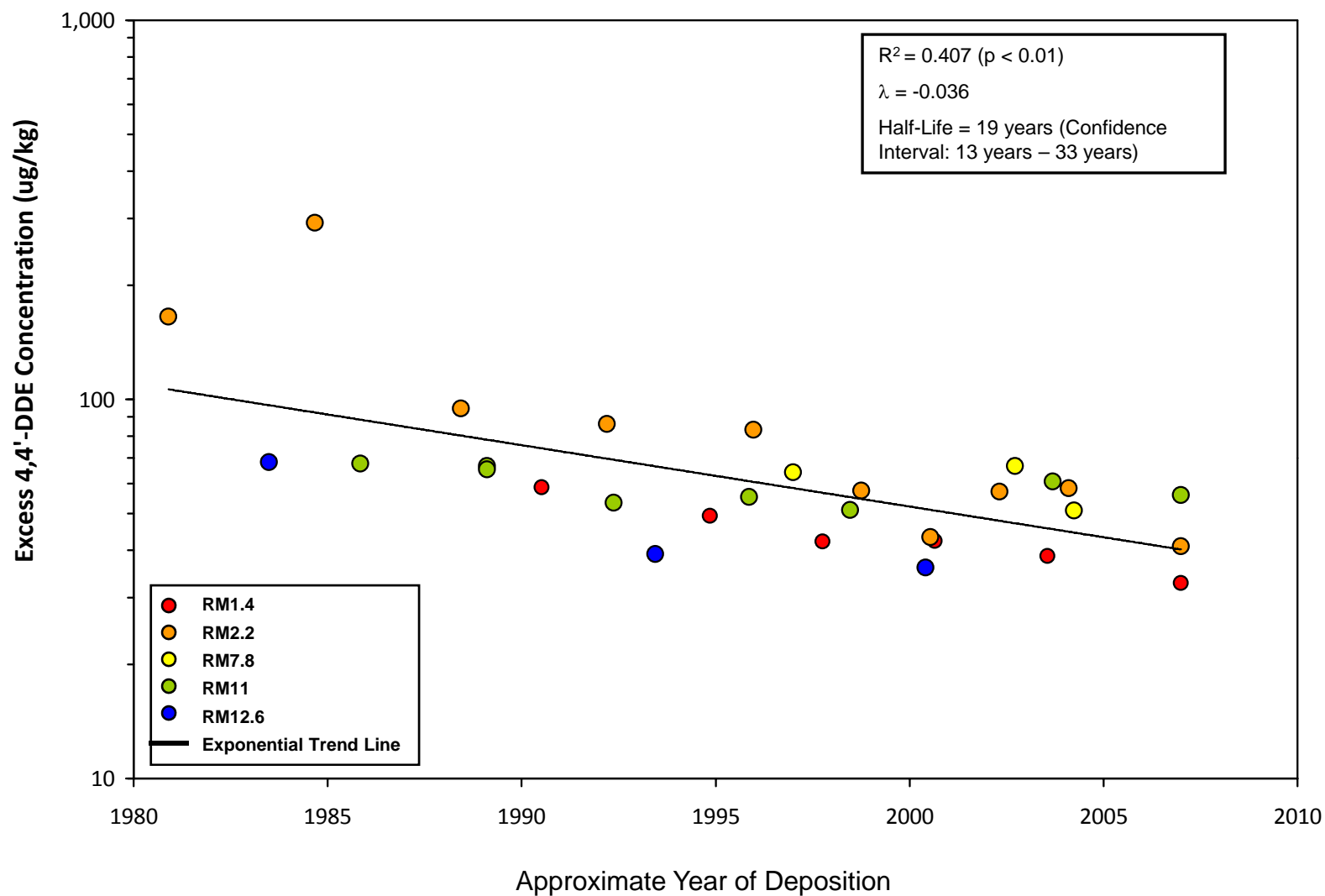


Excess Copper Concentration vs. Approximate Year of Deposition

Figure 20-4

Lower Passaic River Restoration Project

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

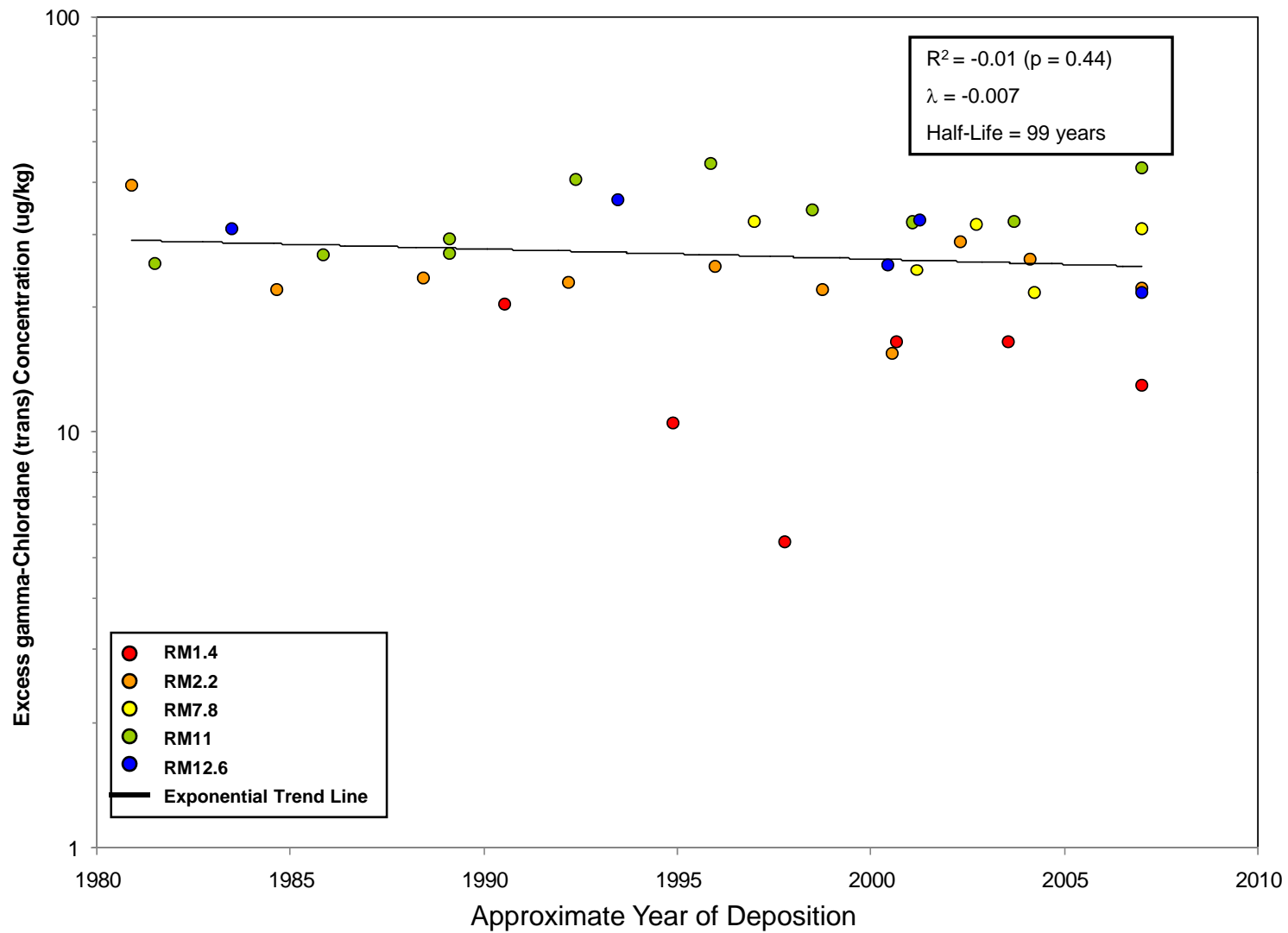


Excess 4,4'-DDE Concentration vs. Approximate Year of Deposition

Figure 20-5

Lower Passaic River Restoration Project

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

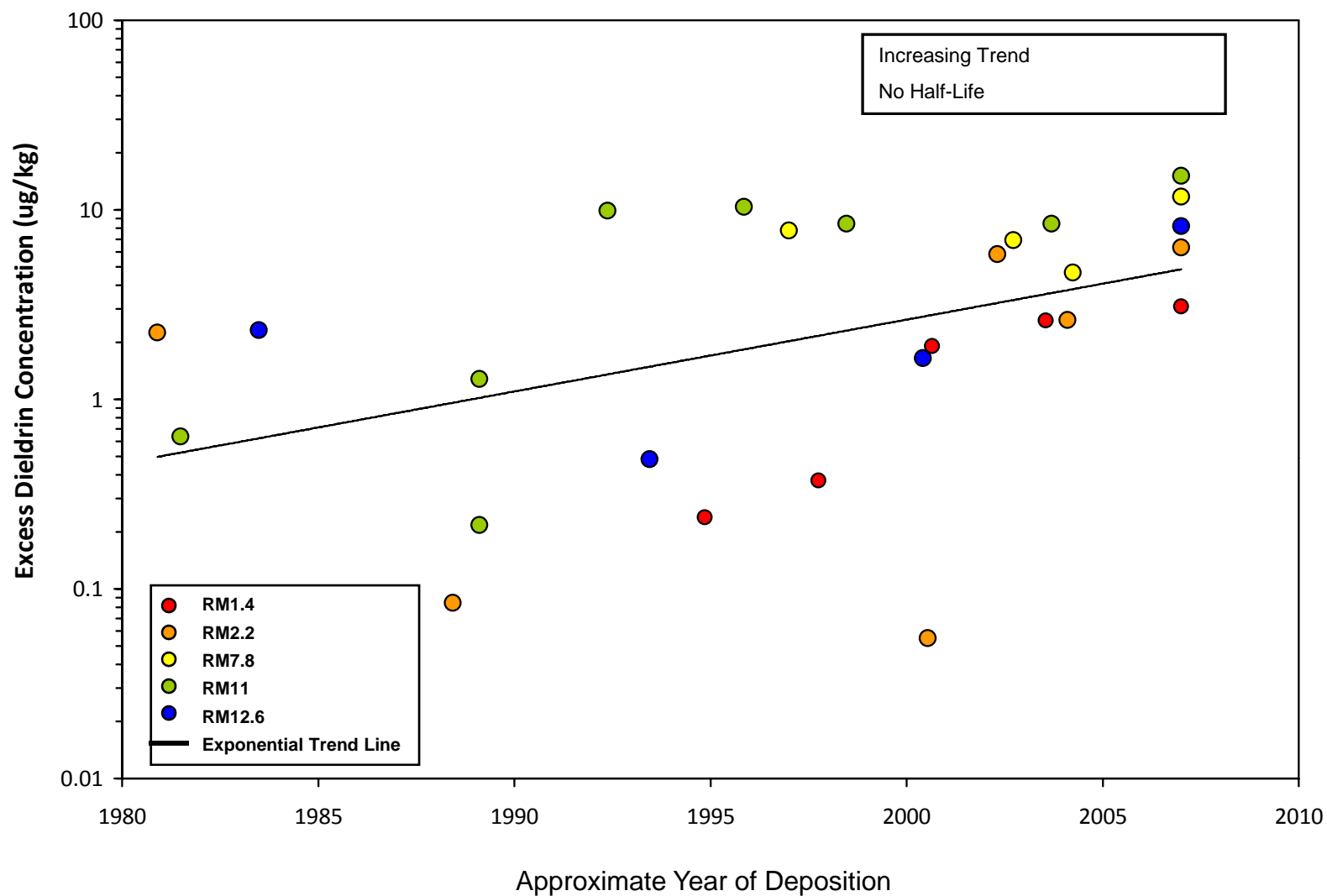


Excess Chlordane Concentration vs. Approximate Year of Deposition

Figure 20-6

Lower Passaic River Restoration Project

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

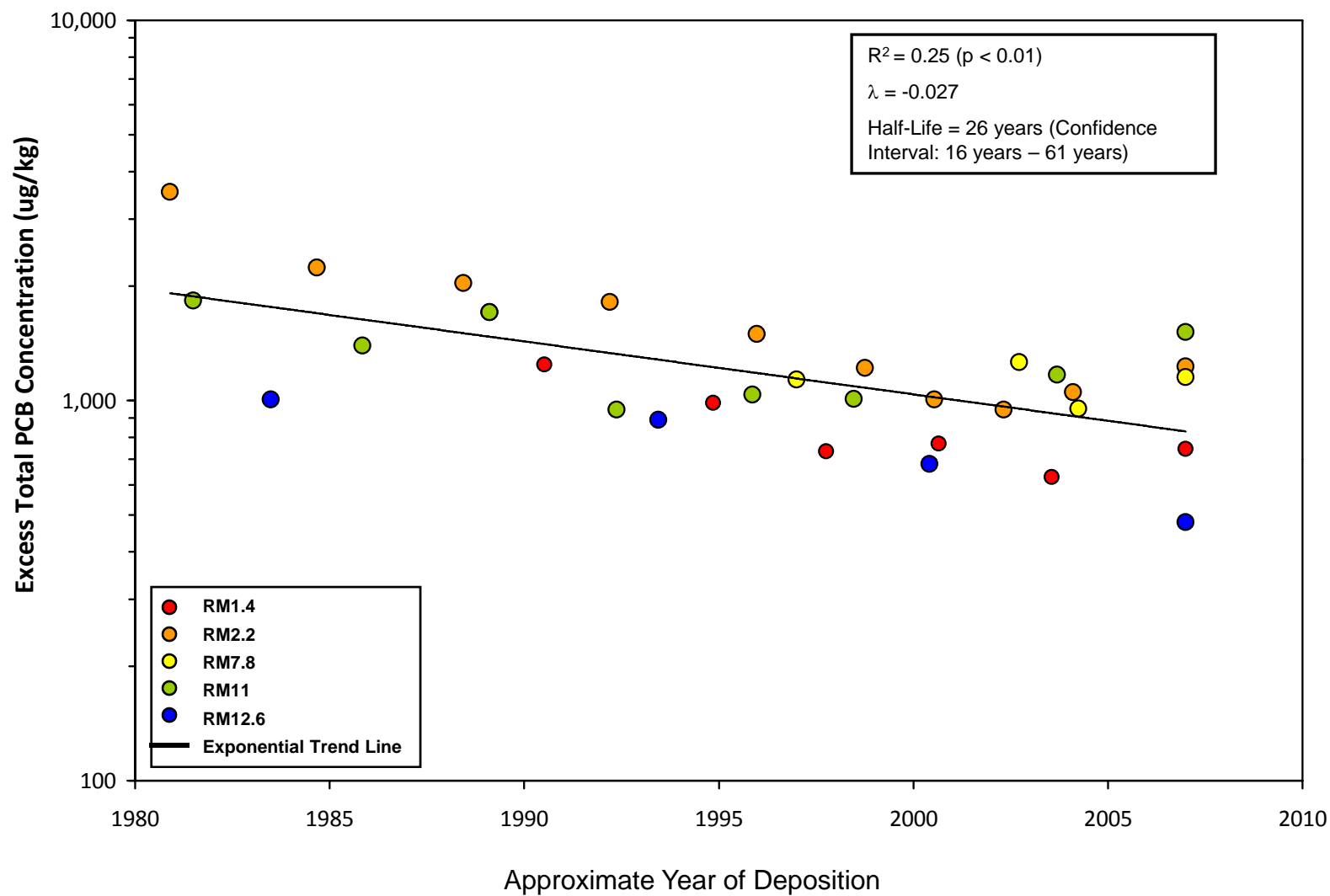


Excess Dieldrin Concentration vs. Approximate Year of Deposition

Figure 20-7

Lower Passaic River Restoration Project

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

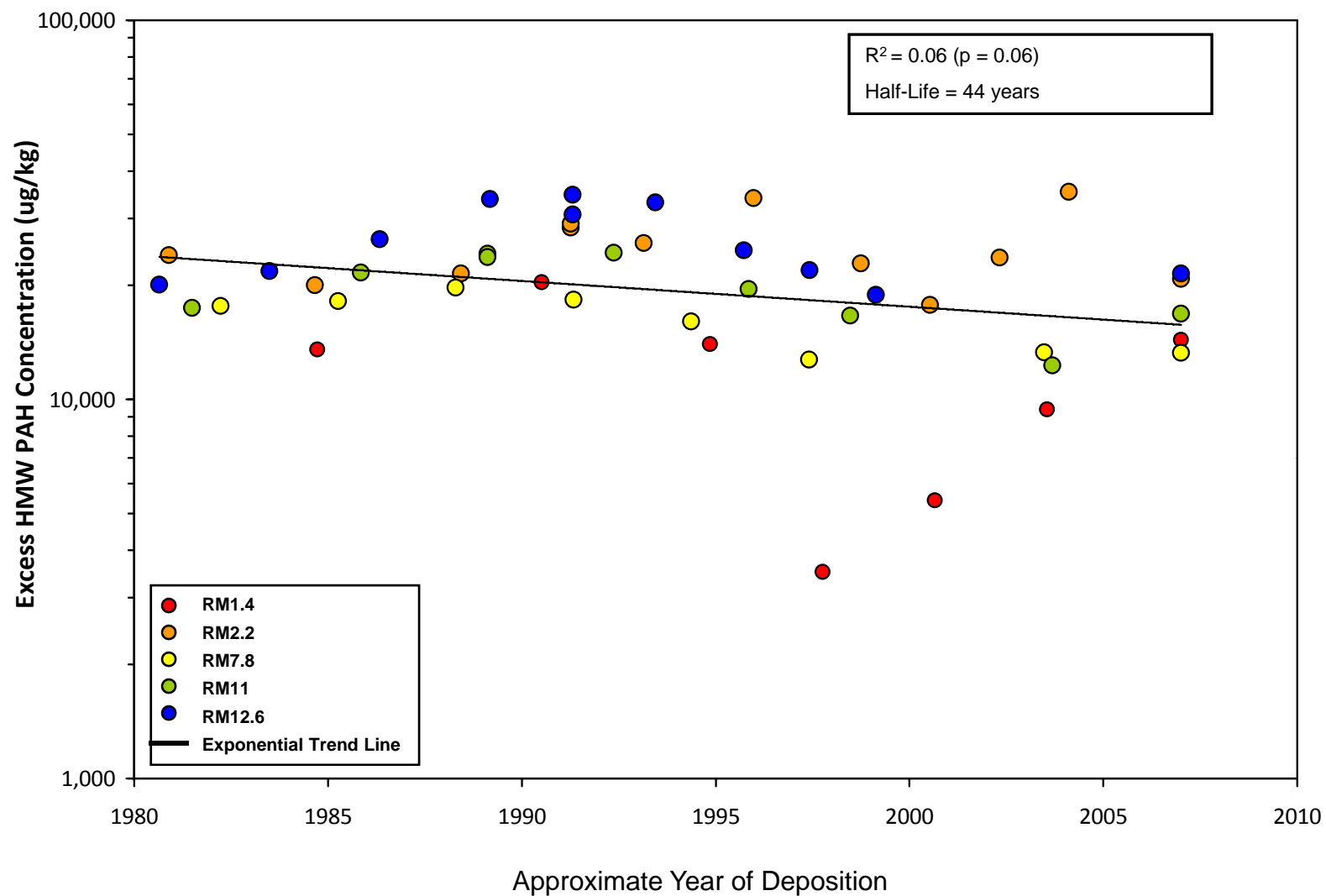


Excess Total PCBs Concentration vs. Approximate Year of Deposition

Figure 20-8

Lower Passaic River Restoration Project

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

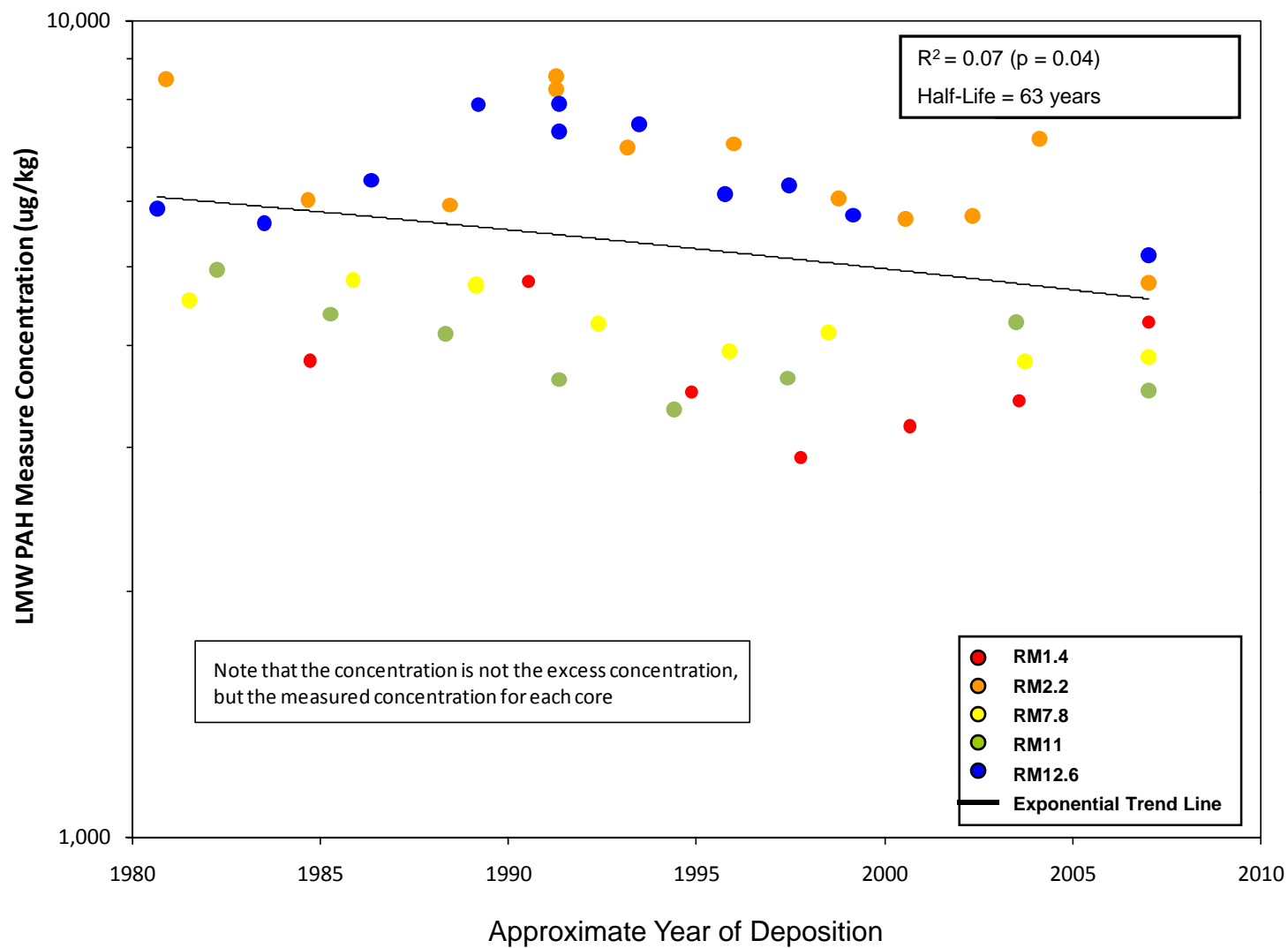


Excess High Molecular Weight PAH Concentration vs. Approximate Year of Deposition

Lower Passaic River Restoration Project

Figure 20-9

2009



Note:

Excess concentration represents the difference between the measured concentration in the Lower Passaic River recently deposited (Be-7 bearing) samples and the baseline concentration. The excess is attributed to resuspension and Newark Bay derived loads.

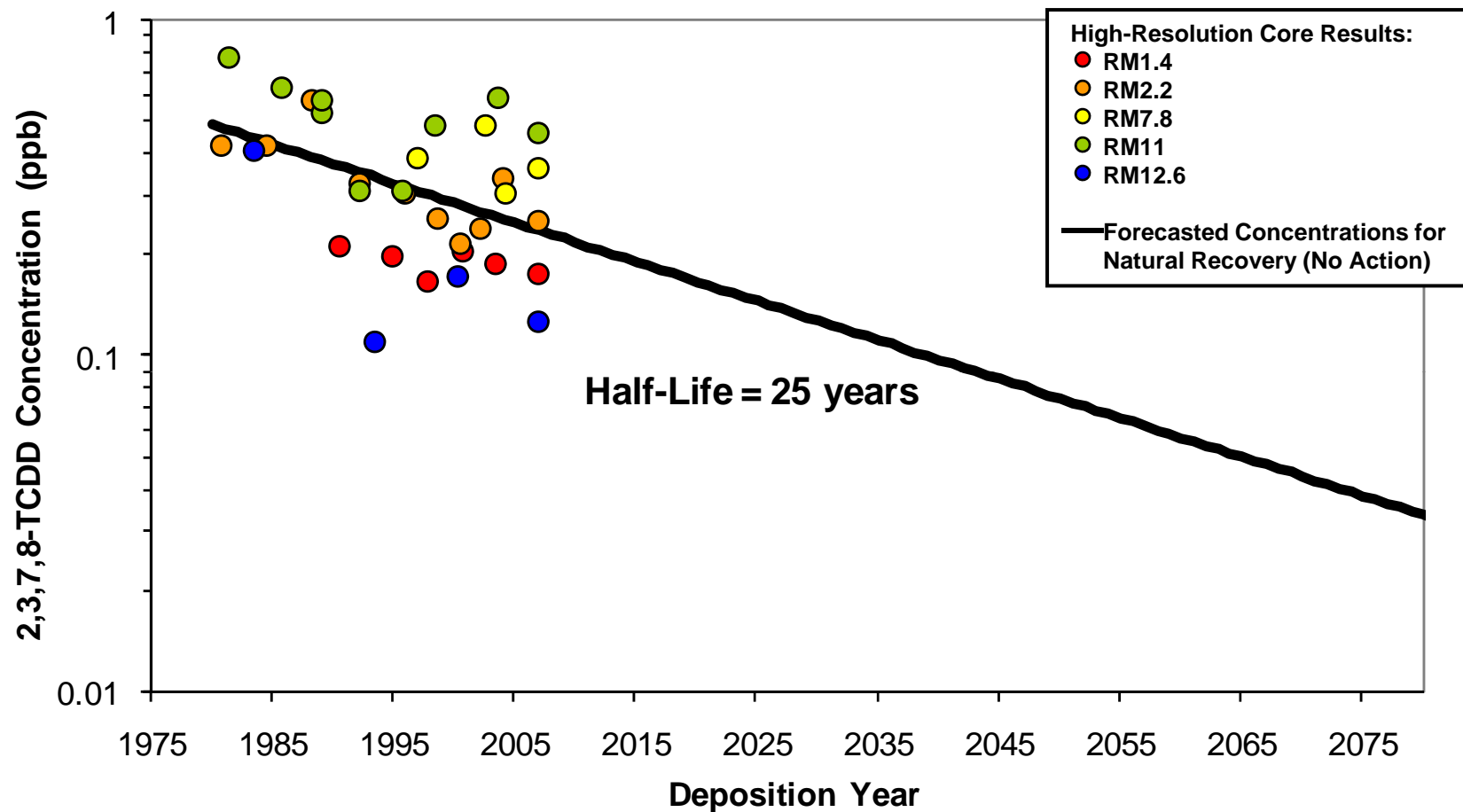


Excess Low Molecular Weight PAH Concentration vs. Approximate Year of Deposition

Lower Passaic River Restoration Project

Figure 20-10

2009

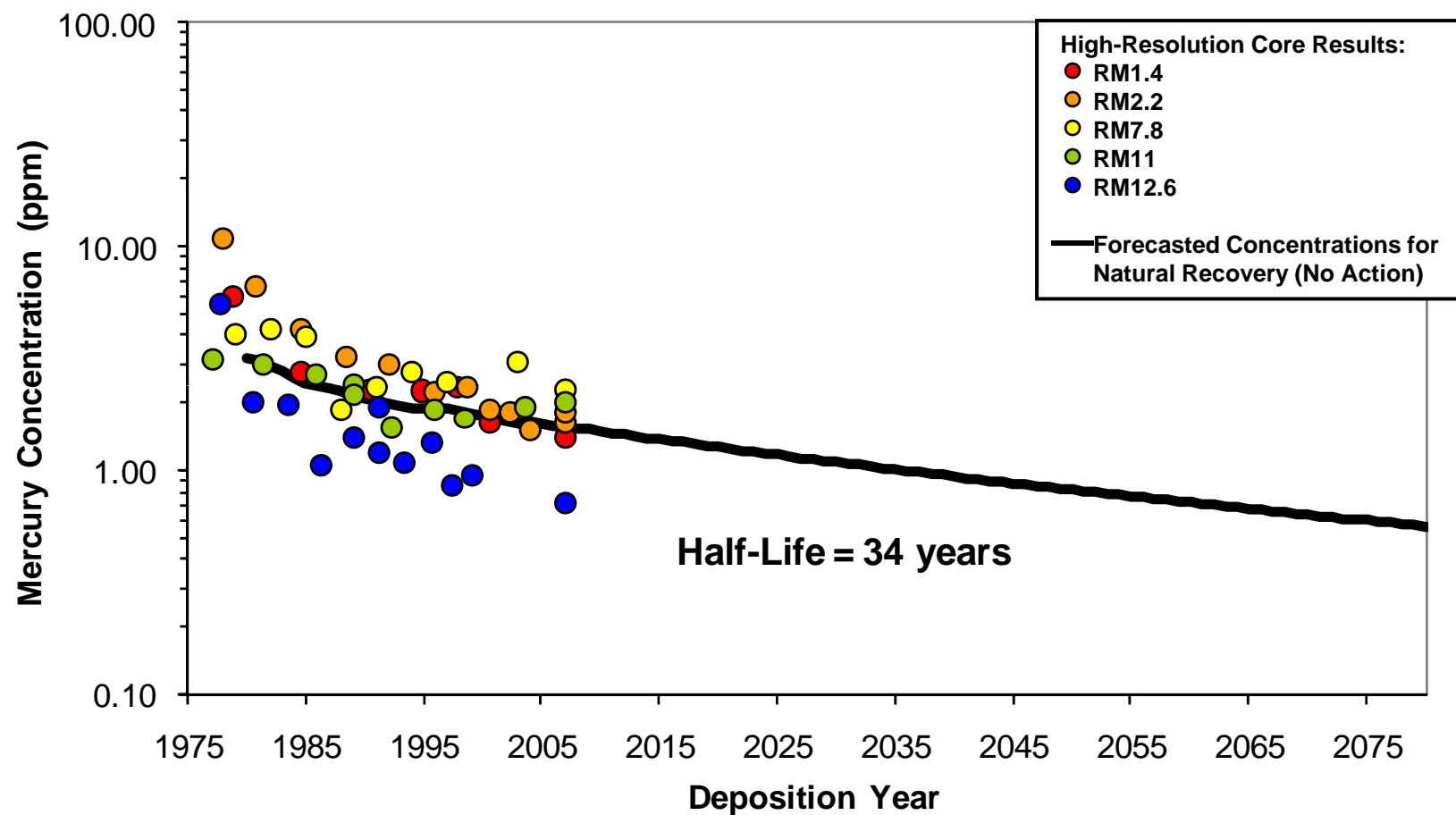


**2,3,7,8-TCDD Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**

*Lower Passaic River Restoration Project*

Figure 20-11

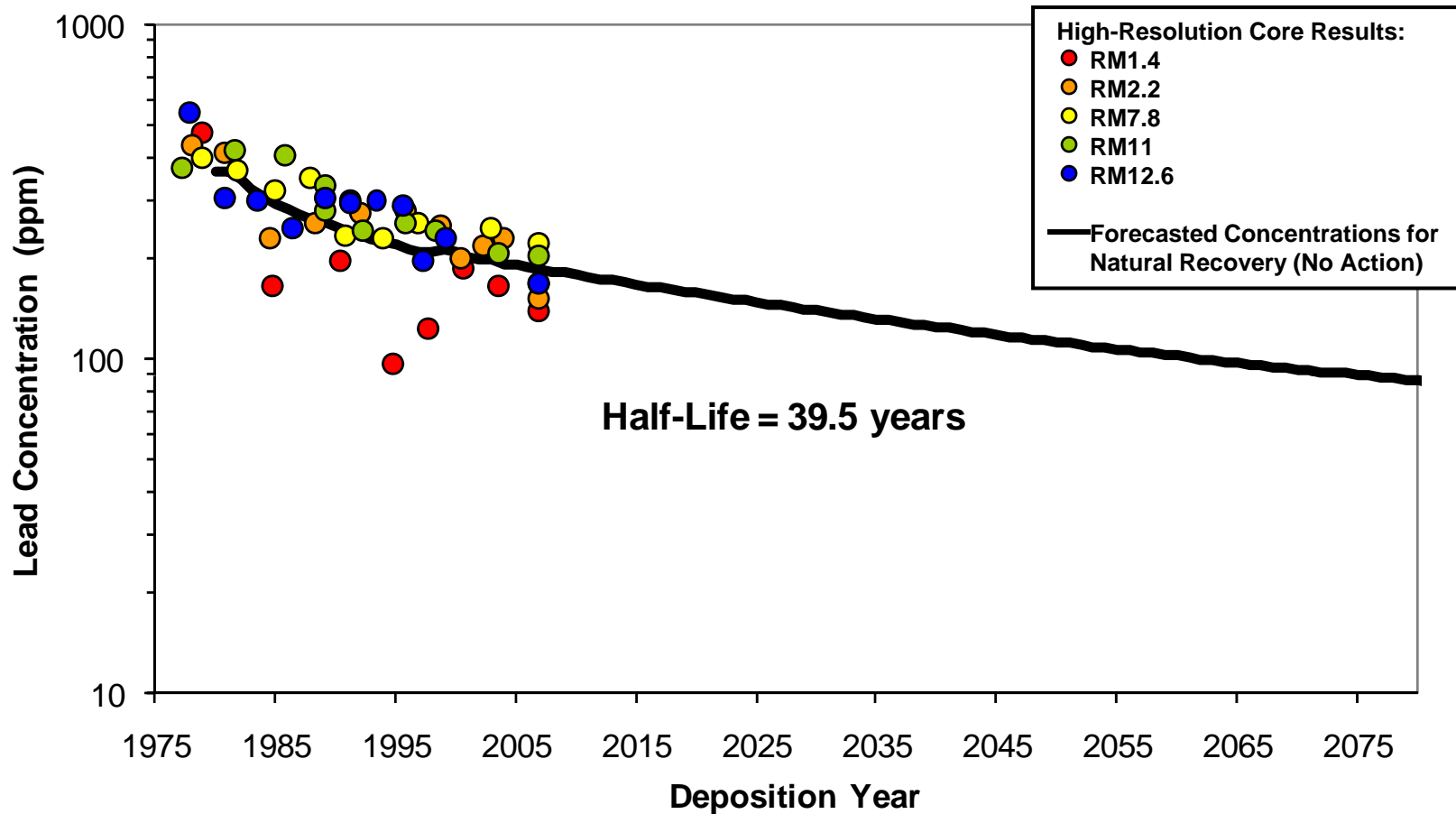
2009



**Mercury Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**  
*Lower Passaic River Restoration Project*

Figure 20-12

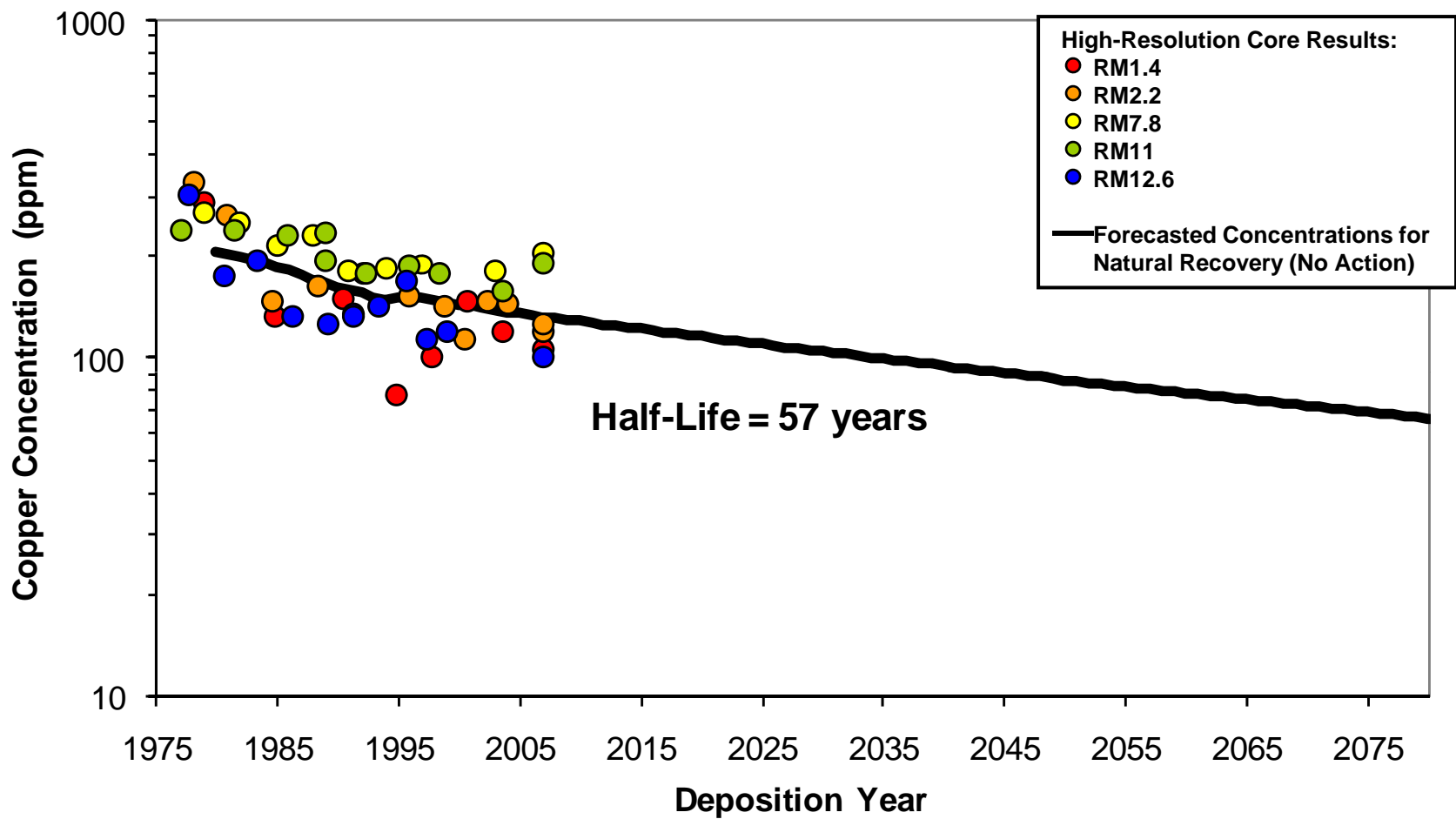
2009



**Lead Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**  
*Lower Passaic River Restoration Project*

Figure 20-13

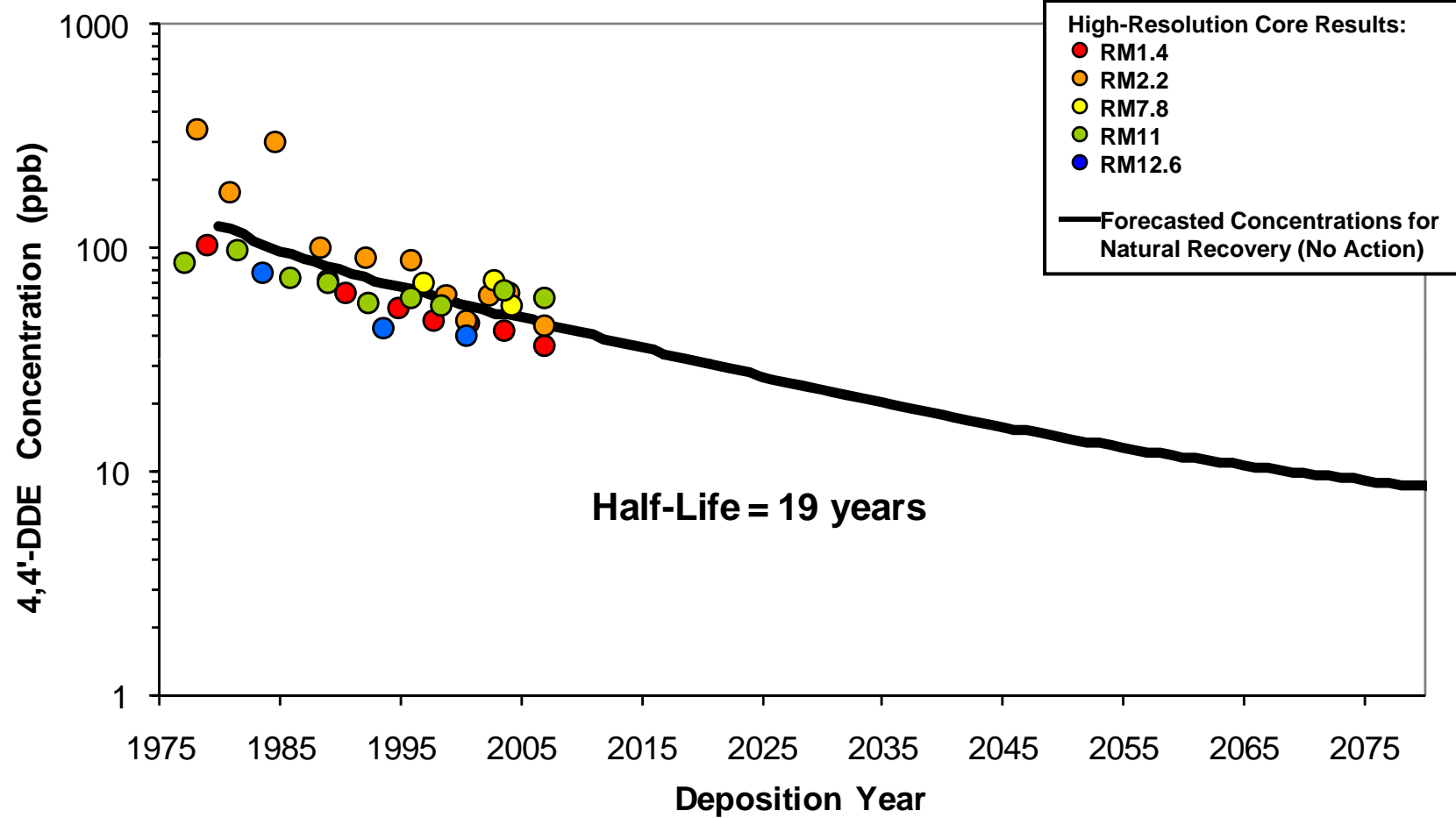
2009



**Copper Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**  
*Lower Passaic River Restoration Project*

Figure 20-14

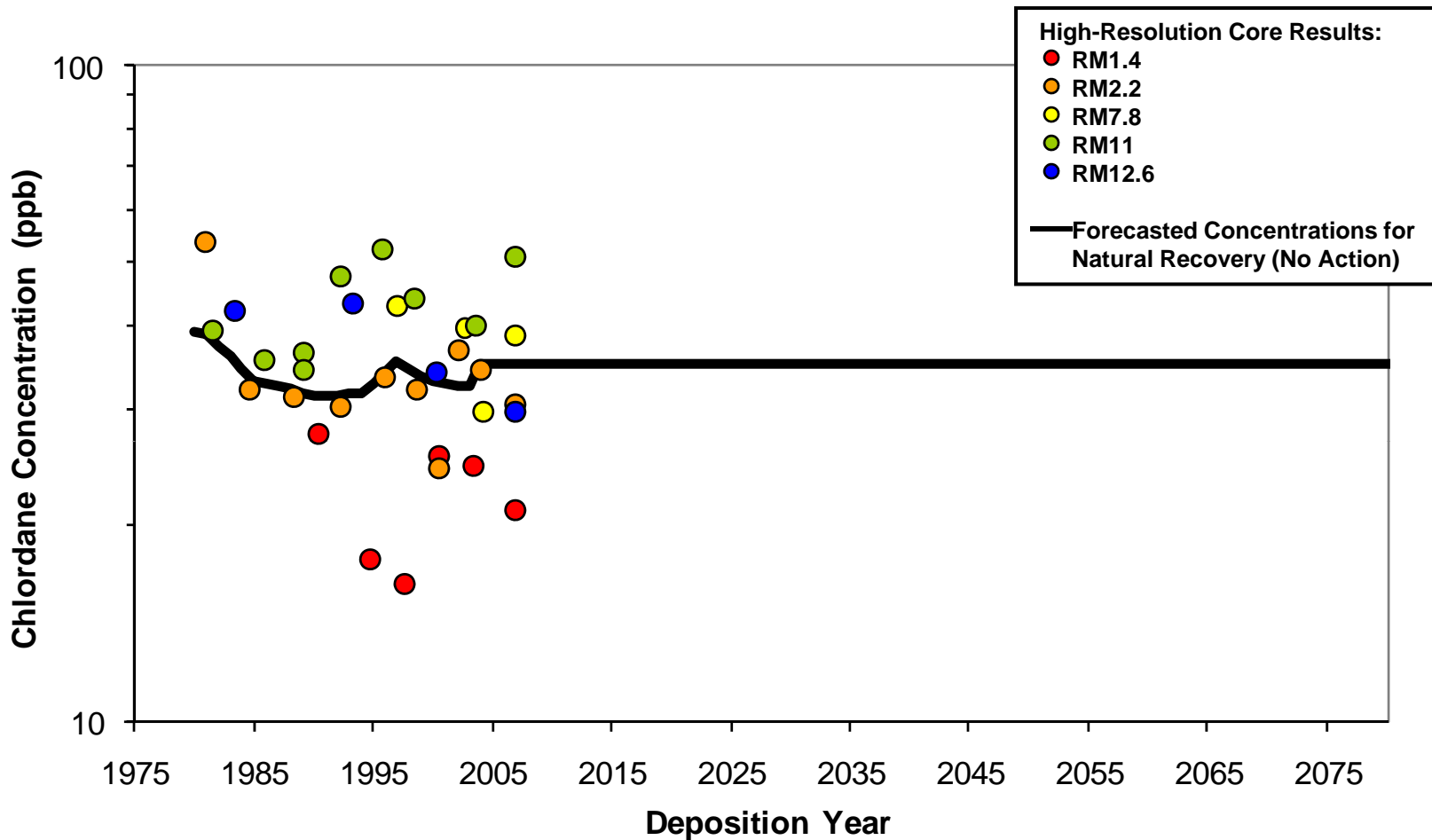
2009



**4,4'-DDE Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**  
*Lower Passaic River Restoration Project*

Figure 20-15

2009

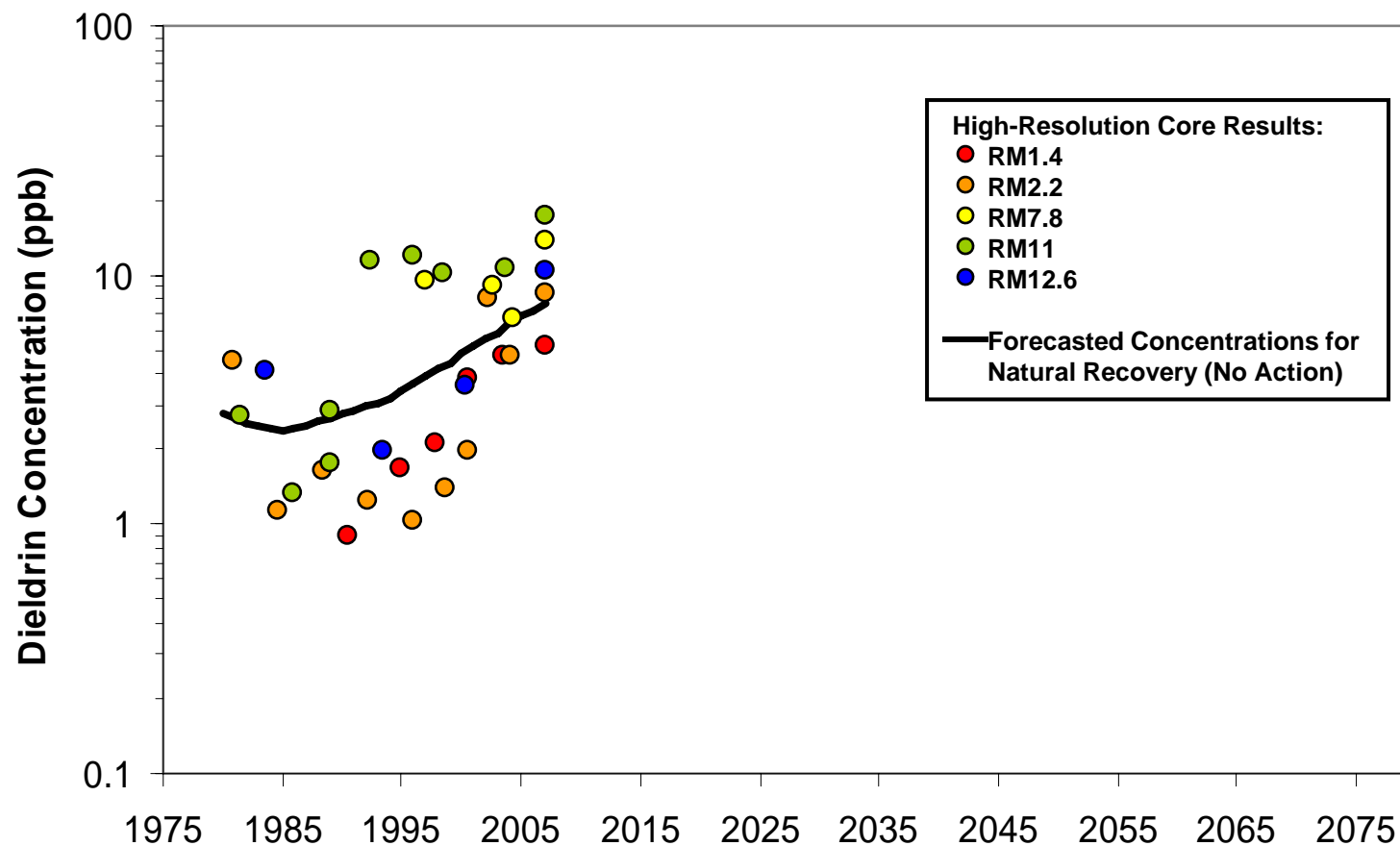


**Chlordane (gamma) Concentrations in Recently Deposited (Be-7 Bearing) Sediments – Measured and Predicted**

*Lower Passaic River Restoration Project*

Figure 20-16

2009



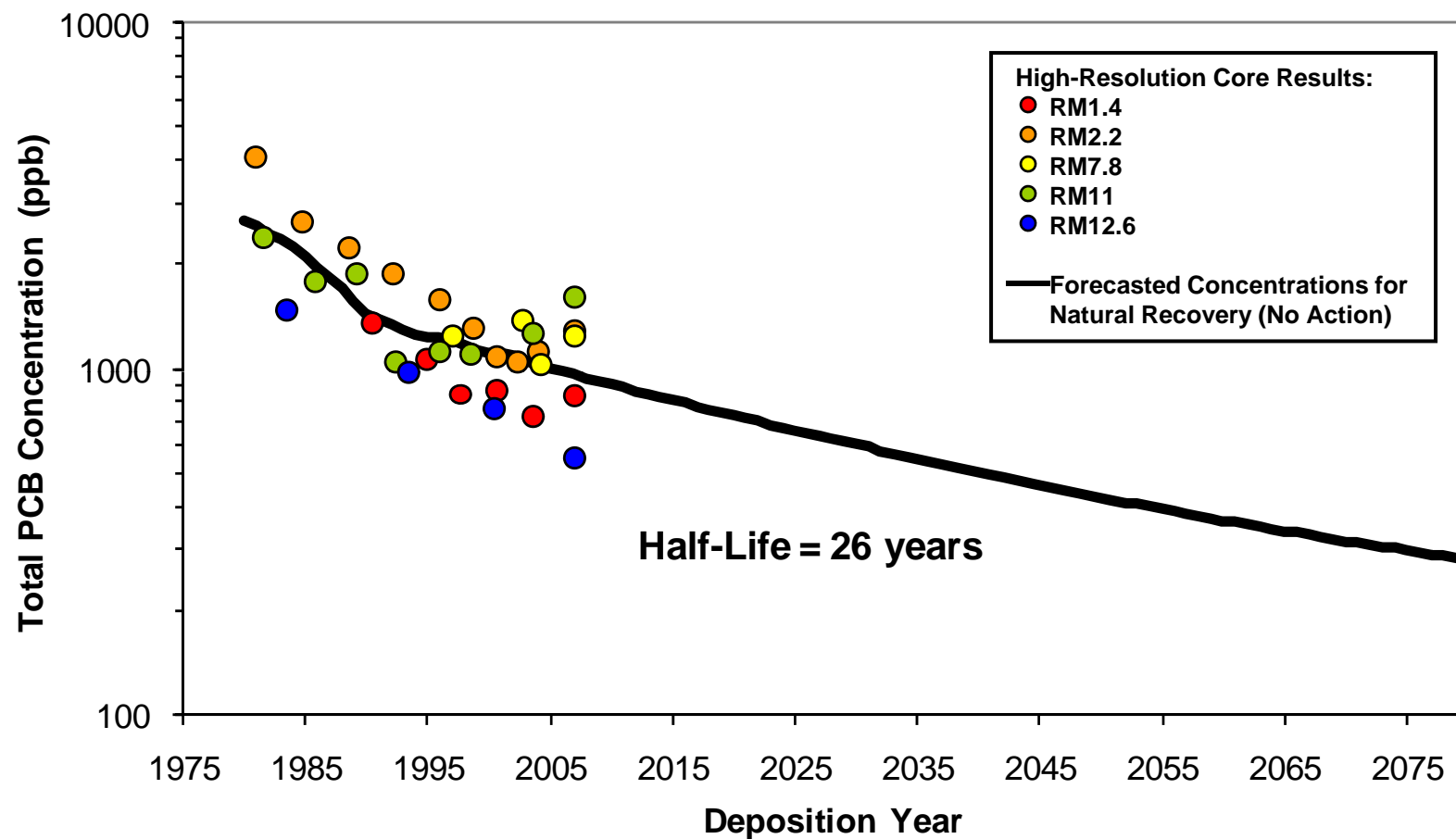
**Year** Note: Dieldrin was found to have a rising trend. This trend cannot be explained by the assumptions inherent in the forecasting process. For this reason, the trend is not extended beyond the measured data.



**Dieldrin Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**  
*Lower Passaic River Restoration Project*

Figure 20-17

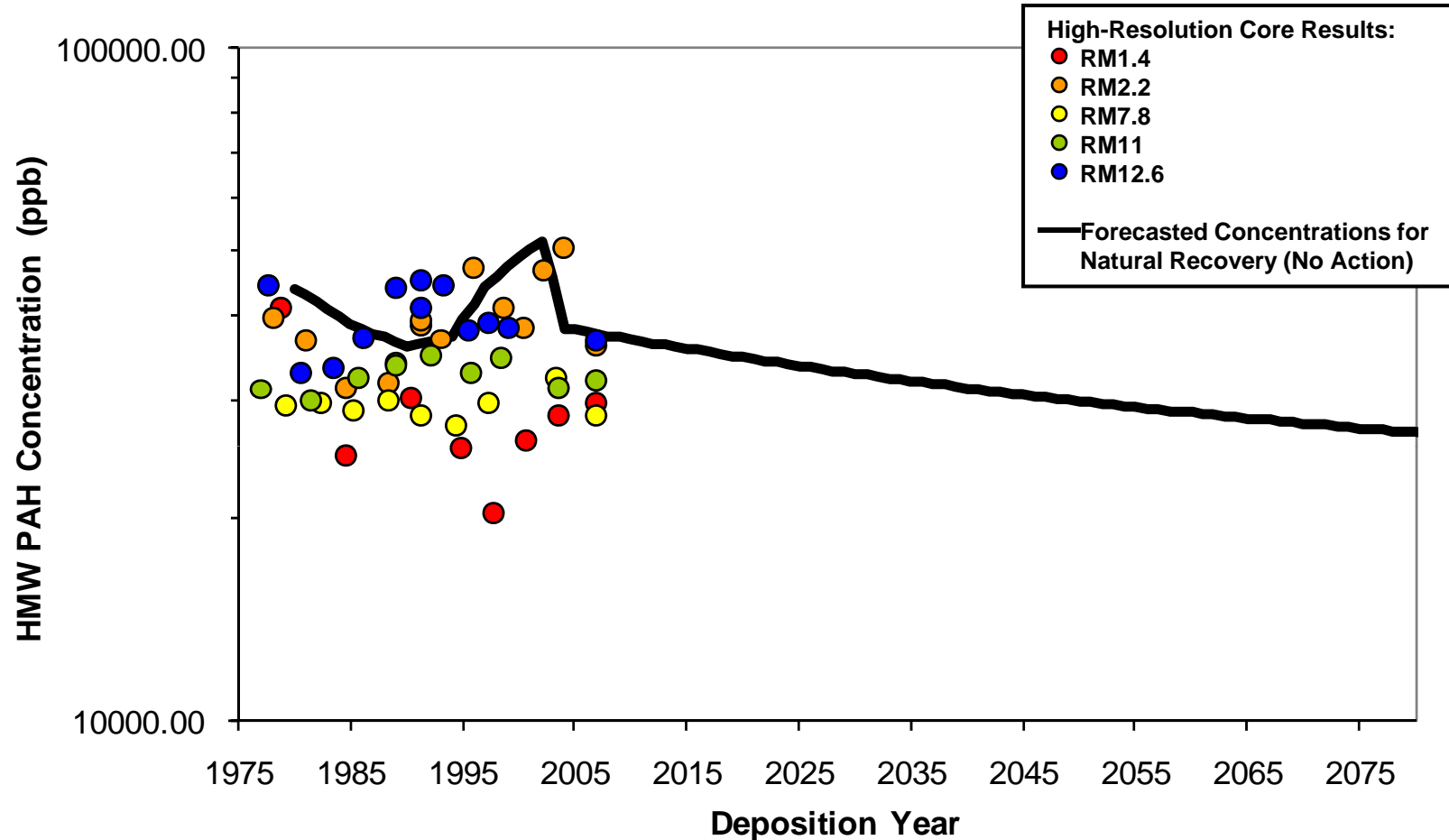
2009



**Total PCB Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**  
*Lower Passaic River Restoration Project*

Figure 20-18

2009



Note: The trend for HMW PAH was found to be statistically insignificant, so no half-life was calculated and it is shown with no long term trend.

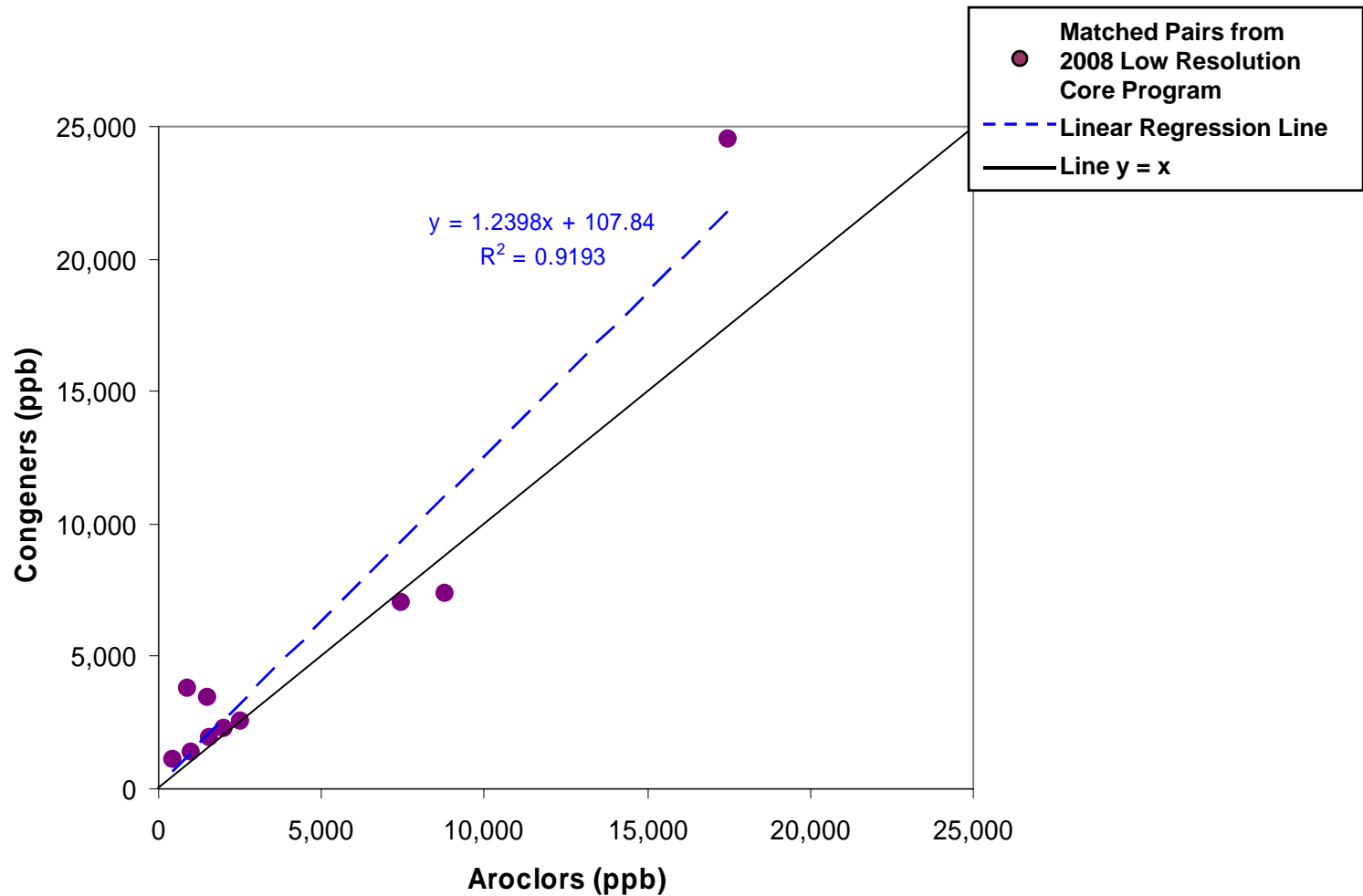


**HMW PAH Concentrations in Recently Deposited (Be-7 Bearing)  
Sediments – Measured and Predicted**

*Lower Passaic River Restoration Project*

**Figure 20-19**

2009



These points indicate the calculation of Total PCB as the sum of the Aroclors vs the sum of the congeners. The data are from the 10 matched pairs from the 2008 Low Resolution Cores from above RM8.

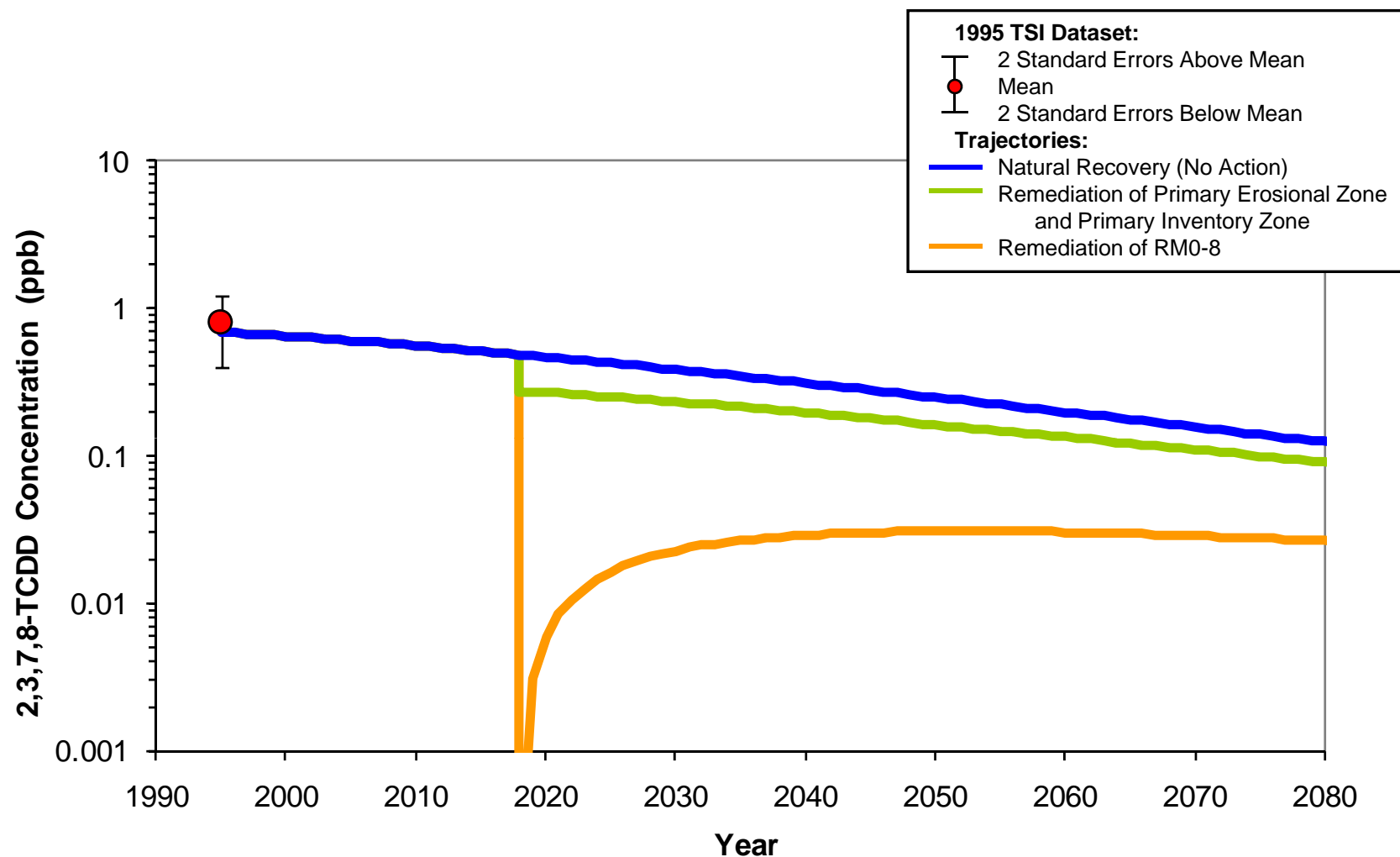


**Comparison of Total PCB when Calculated as the Sum of the Congeners vs. the Sum of the Aroclors for 10 Matched Pairs from the 2008 Low Resolution Cores**

*Lower Passaic River Restoration Project*

**Figure 20-20**

2009



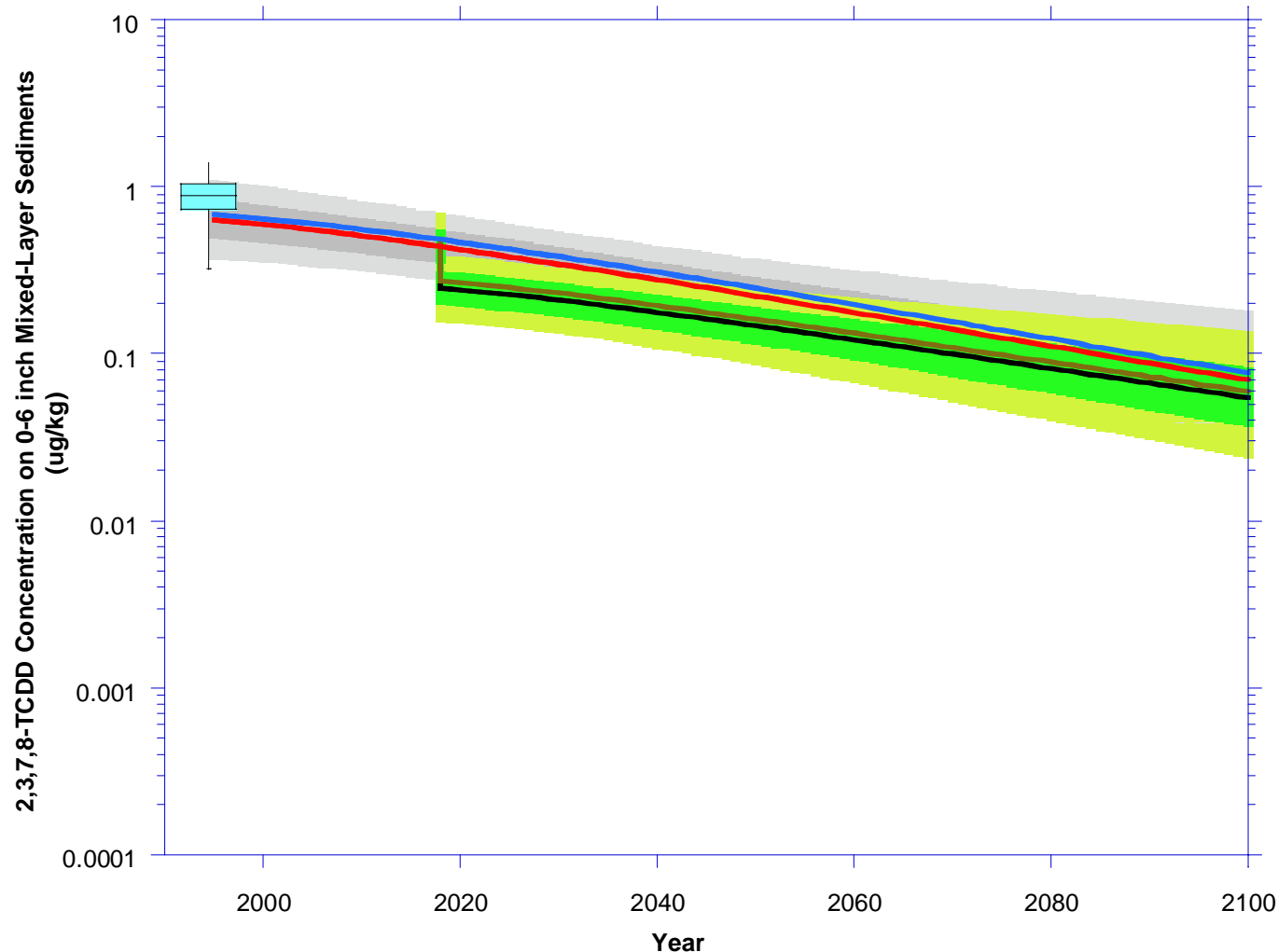
2,3,7,8-TCDD - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-21A

2009

# MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone



## Legend

### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Primary Erosional Zone and Primary Inventory Zone

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

## Note

Best Estimate represents trajectory results using average input values for all parameters.



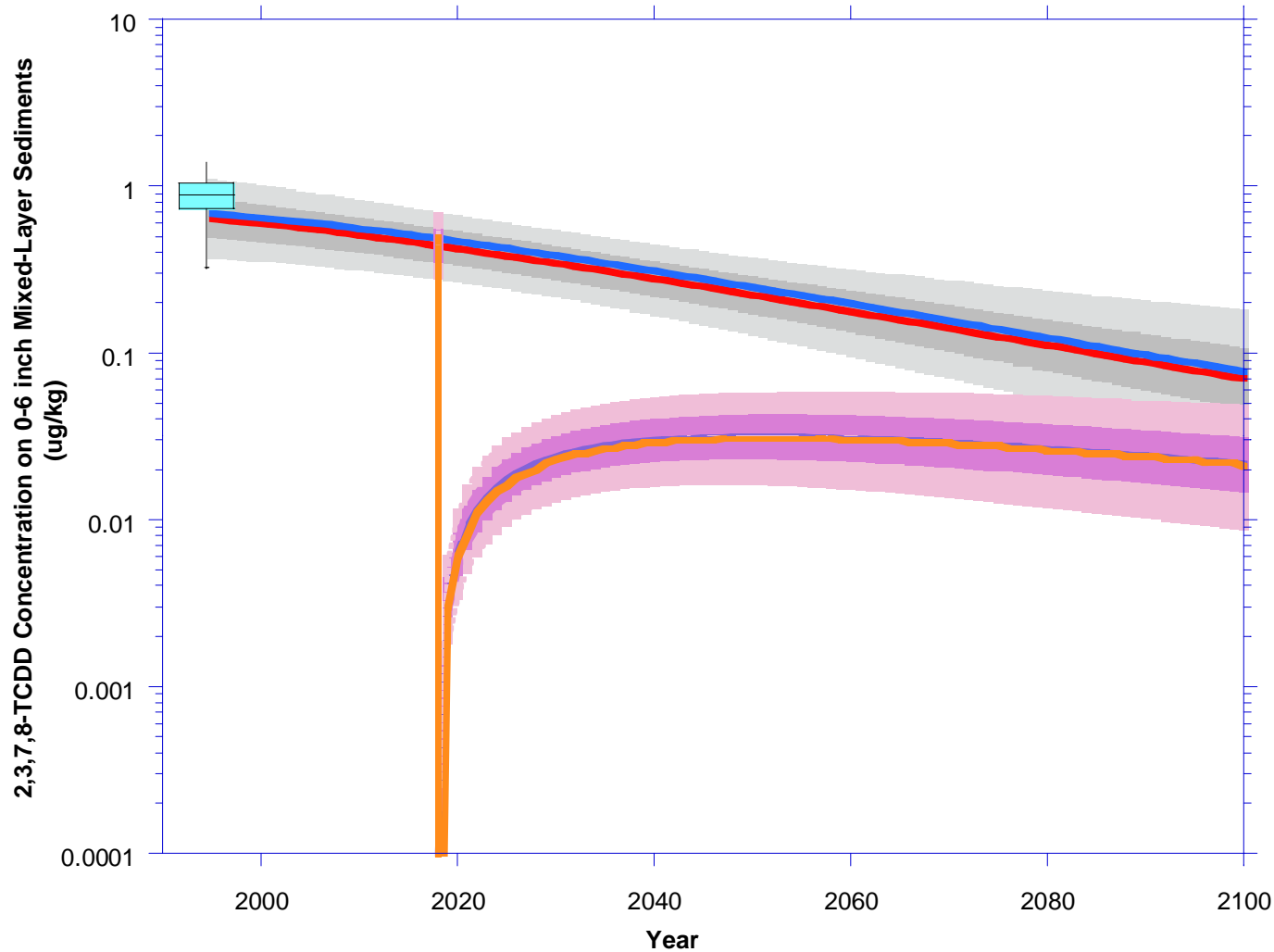
Monte Carlo Trajectory Results for 2,3,7,8-TCDD Concentration in 0-6 inch Biologically Active Layer (MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone)

Lower Passaic River Restoration Project

Figure 20-21B

2009

## MNR and Remediation of RM0-8



### Note

Best Estimate represents trajectory results using average input values for all parameters.

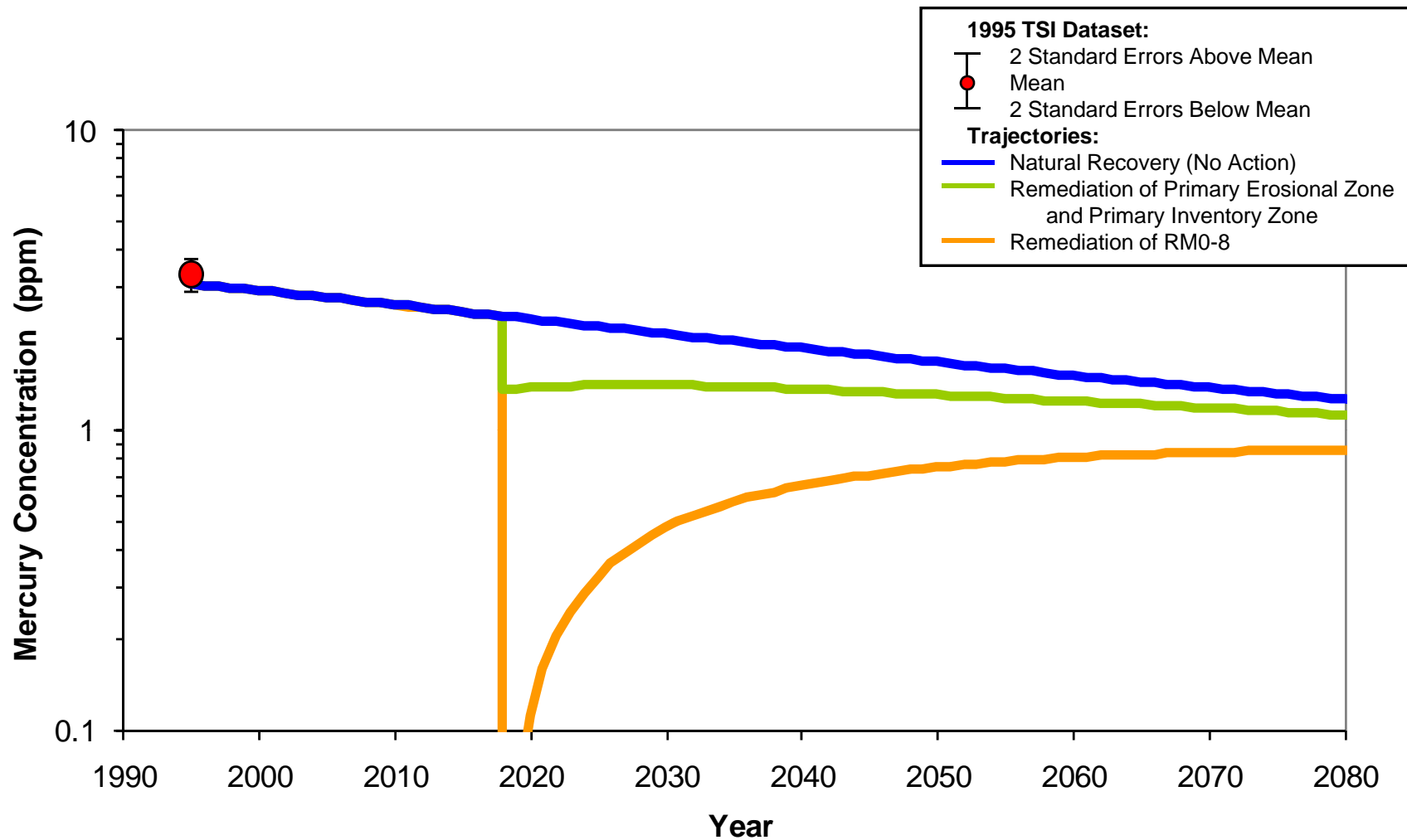


**Monte Carlo Trajectory Results for 2,3,7,8-TCDD Concentration in 0-6 inch Biologically Active Layer (MNR and Remediation of RM 0 to 8)**

*Lower Passaic River Restoration Project*

**Figure 20-21C**

2009



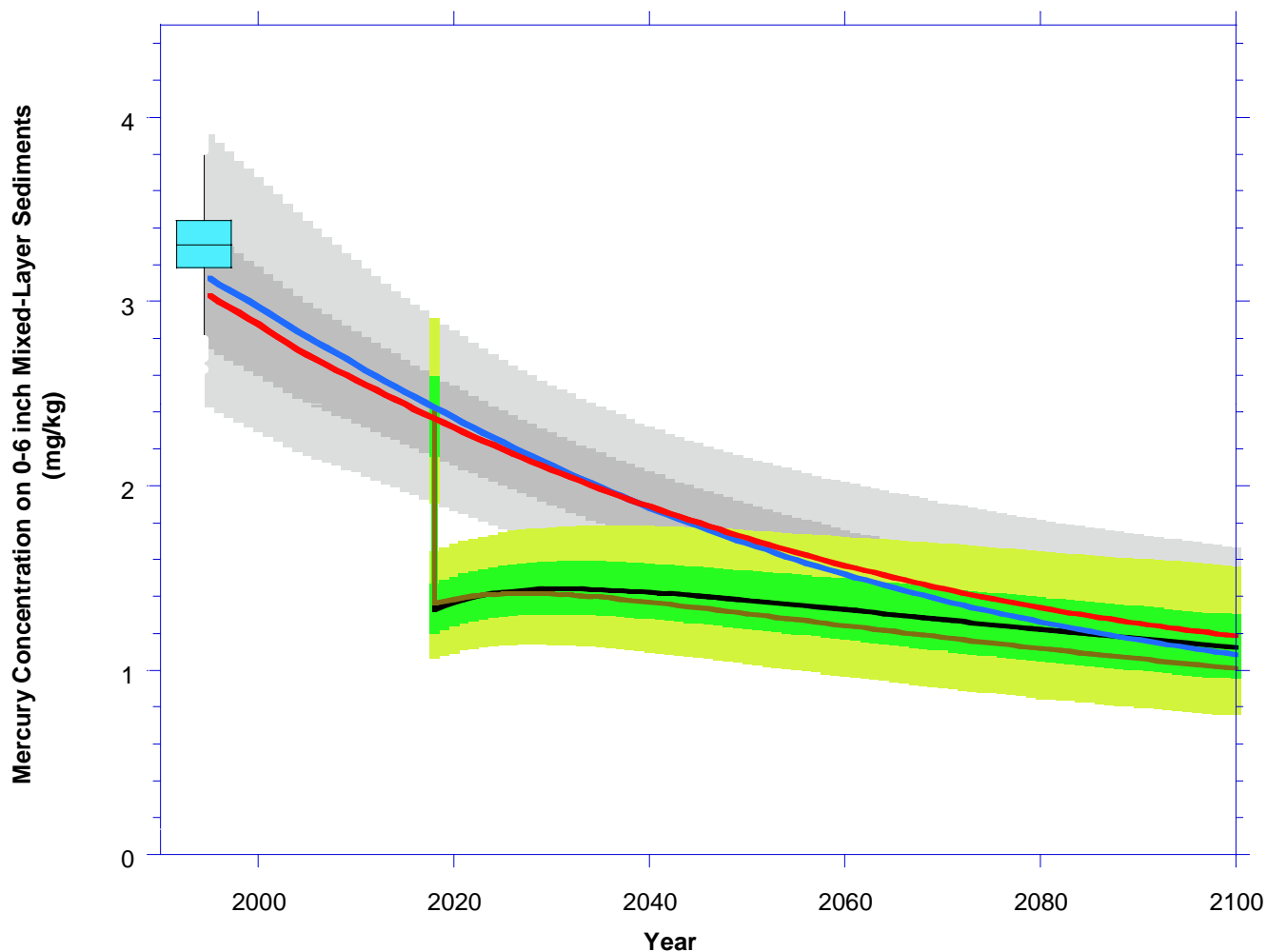
**Mercury - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer**

*Lower Passaic River Restoration Project*

Figure 20-22A

2009

## MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone



### Legend

#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Primary Erosional Zone and Primary Inventory Zone

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

### Note

Best Estimate represents trajectory results using average input values for all parameters.



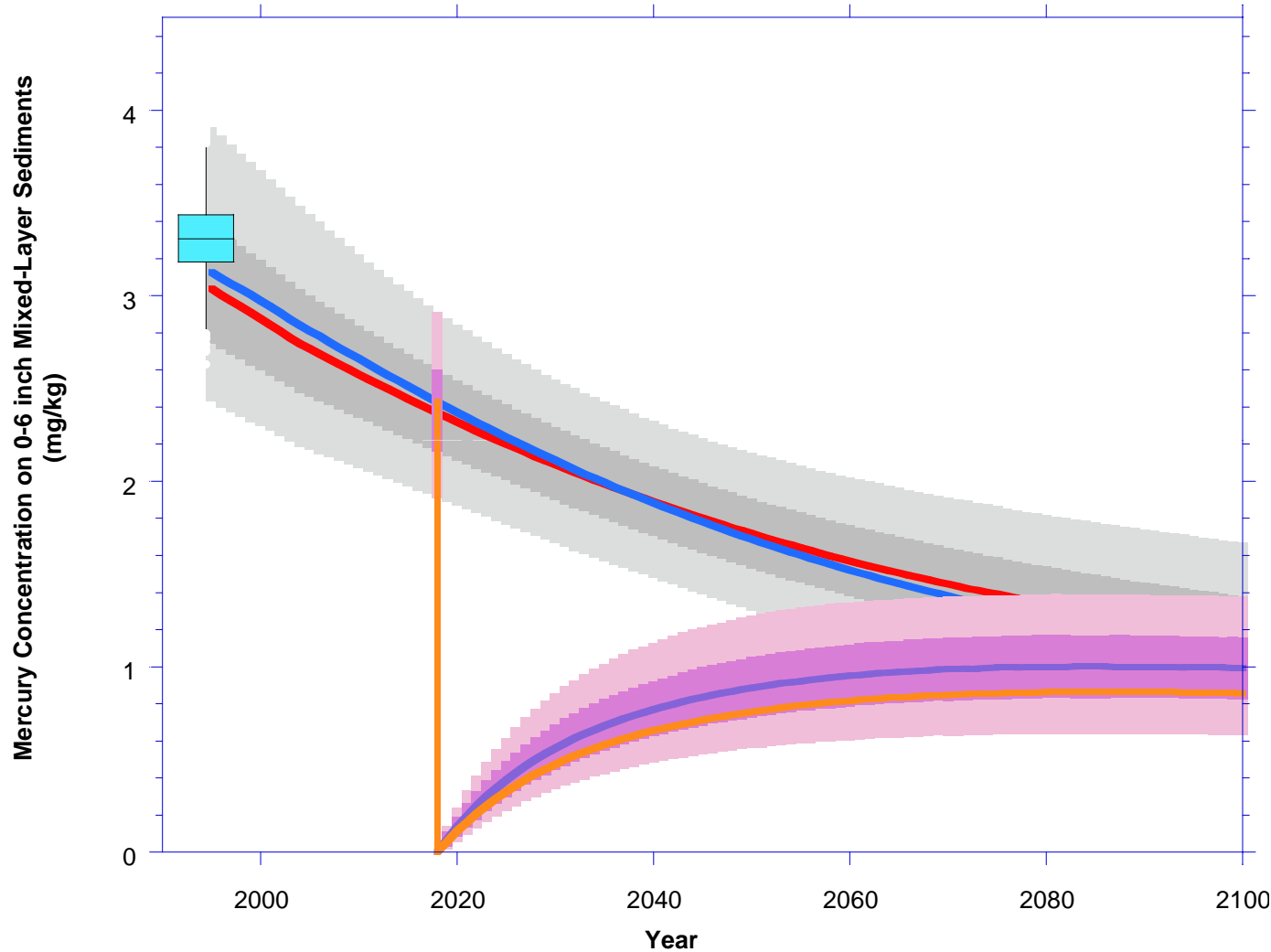
Monte Carlo Trajectory Results for Mercury Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone)

*Lower Passaic River Restoration Project*

Figure 20-22B

2009

## MNR and Remediation of RM0-8



### Legend

#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### RM0-8 Remediation

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

### Note

Best Estimate represents trajectory results using average input values for all parameters.

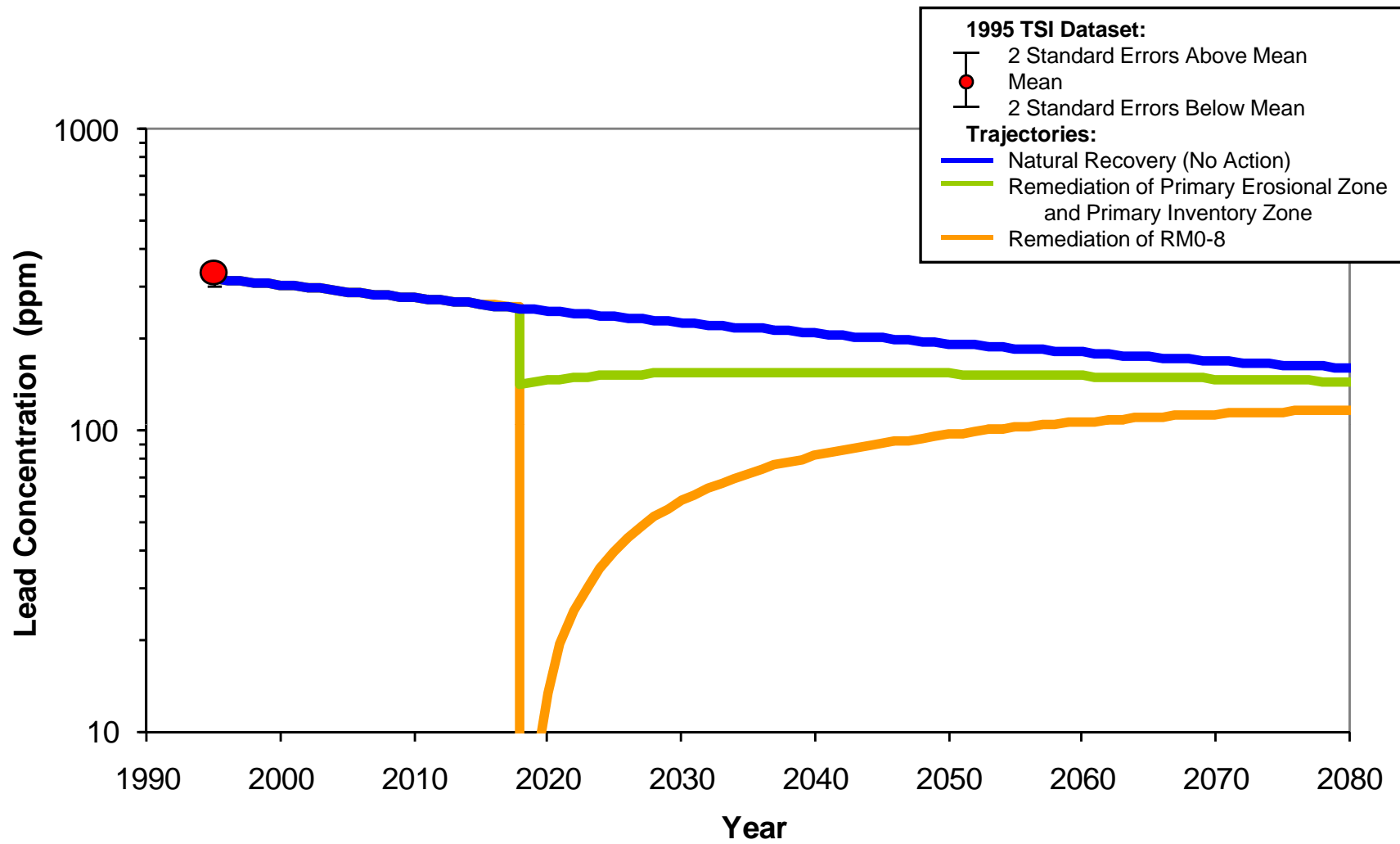


Monte Carlo Trajectory Results for Mercury Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of RM 0 to 8)

*Lower Passaic River Restoration Project*

Figure 20-22C

2009



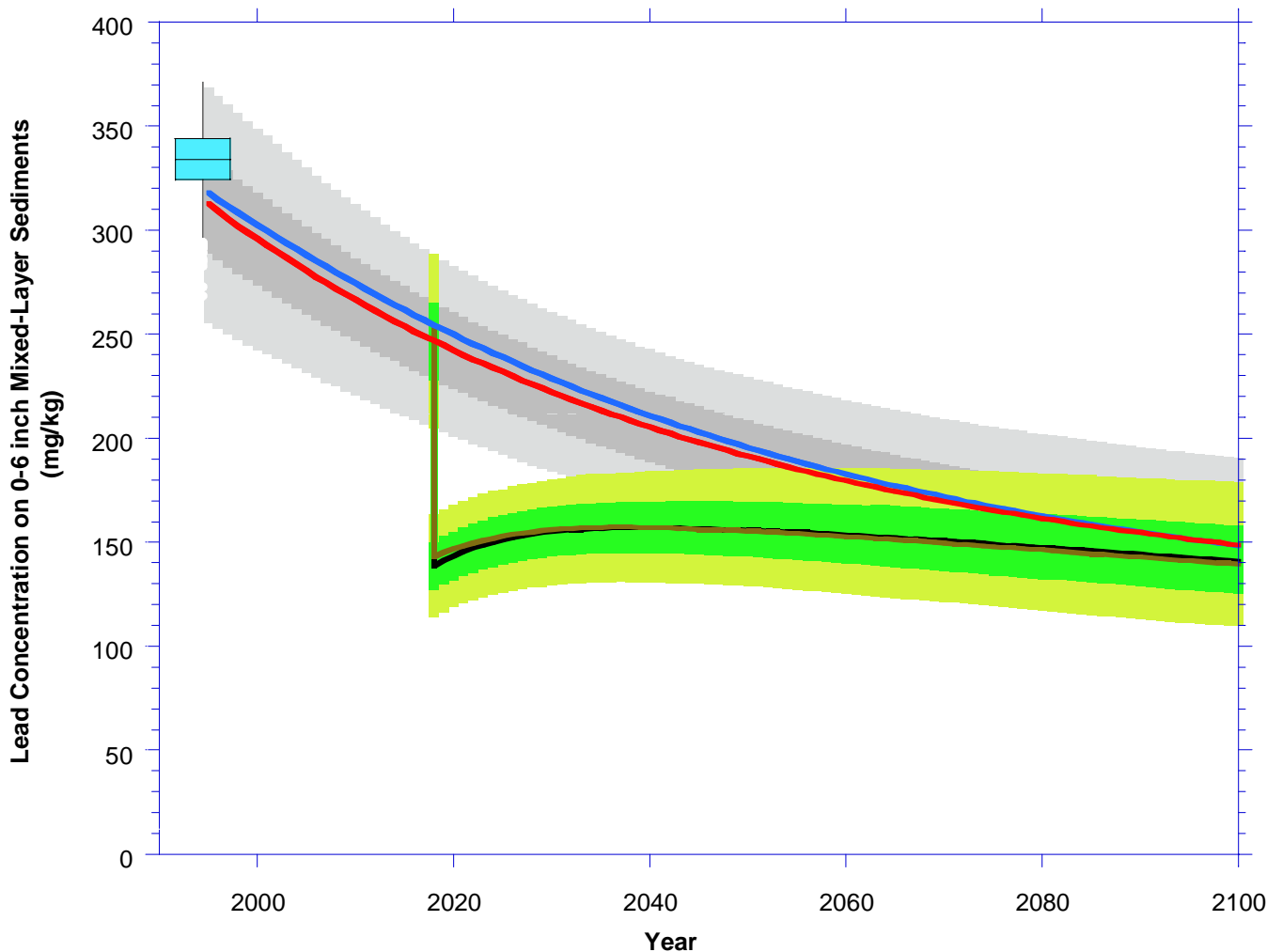
Lead - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-23A

2009

# MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone



## Legend

### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Primary Erosional Zone and Primary Inventory Zone

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

## Note

Best Estimate represents trajectory results using average input values for all parameters.



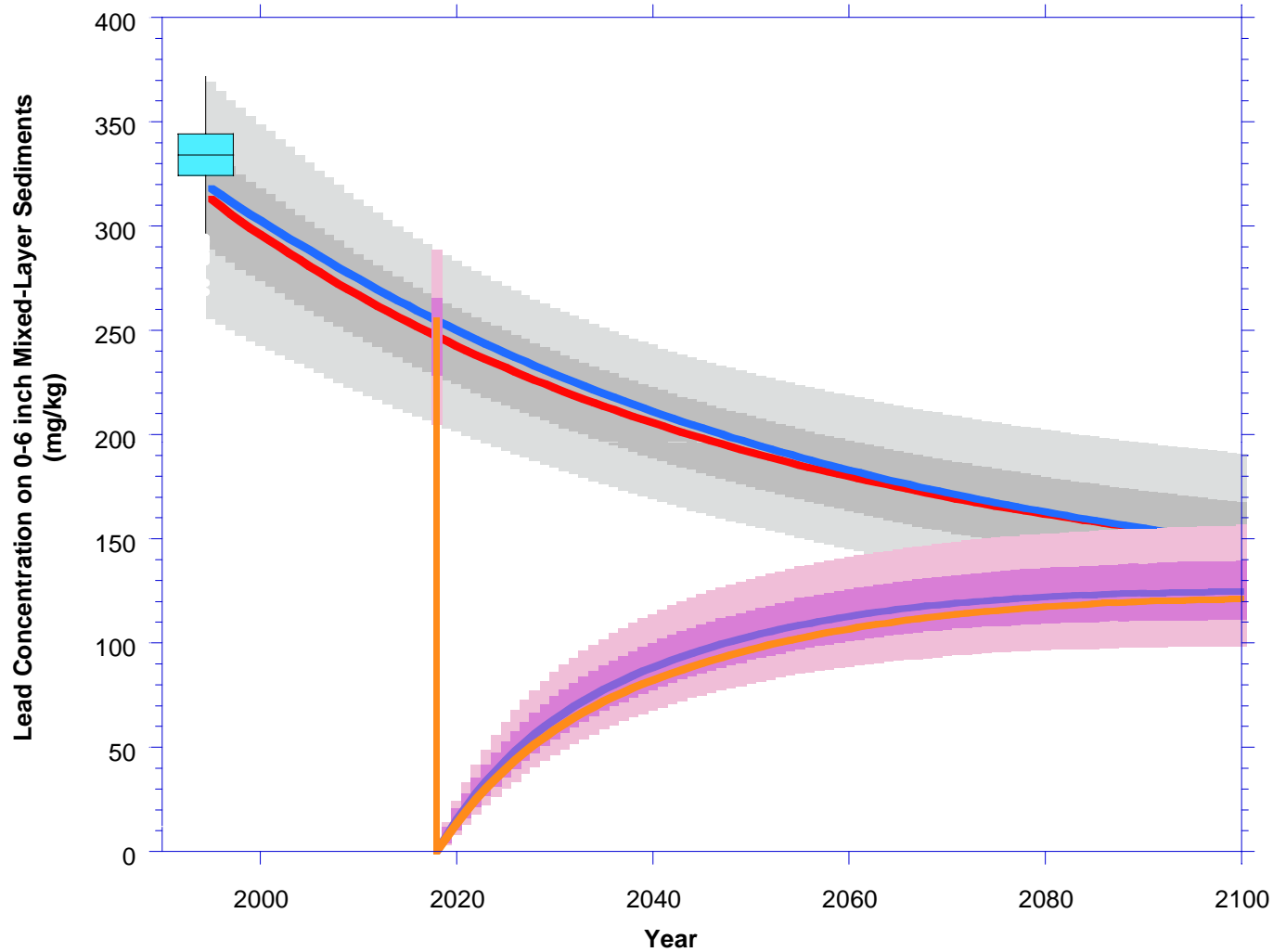
**Monte Carlo Trajectory Results for Lead Concentration in 0-6 inch Biologically Active Layer (MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone)**

*Lower Passaic River Restoration Project*

**Figure 20-23B**

2009

## MNR and Remediation of RM0-8



### Legend

#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### RM0-8 Remediation

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

### Note

Best Estimate represents trajectory results using average input values for all parameters.

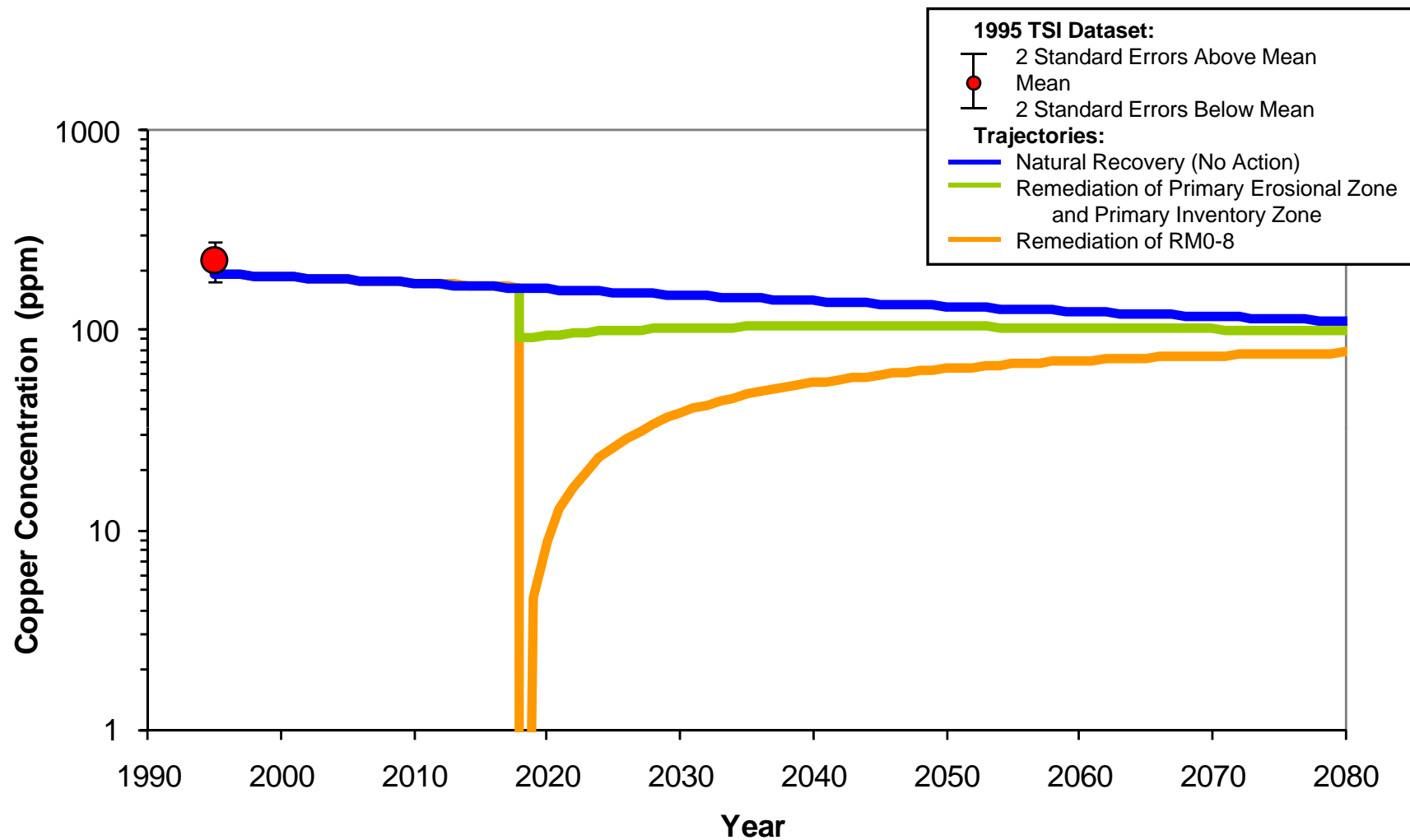


Monte Carlo Trajectory Results for Lead Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of RM 0 to 8)

*Lower Passaic River Restoration Project*

Figure 20-23C

2009



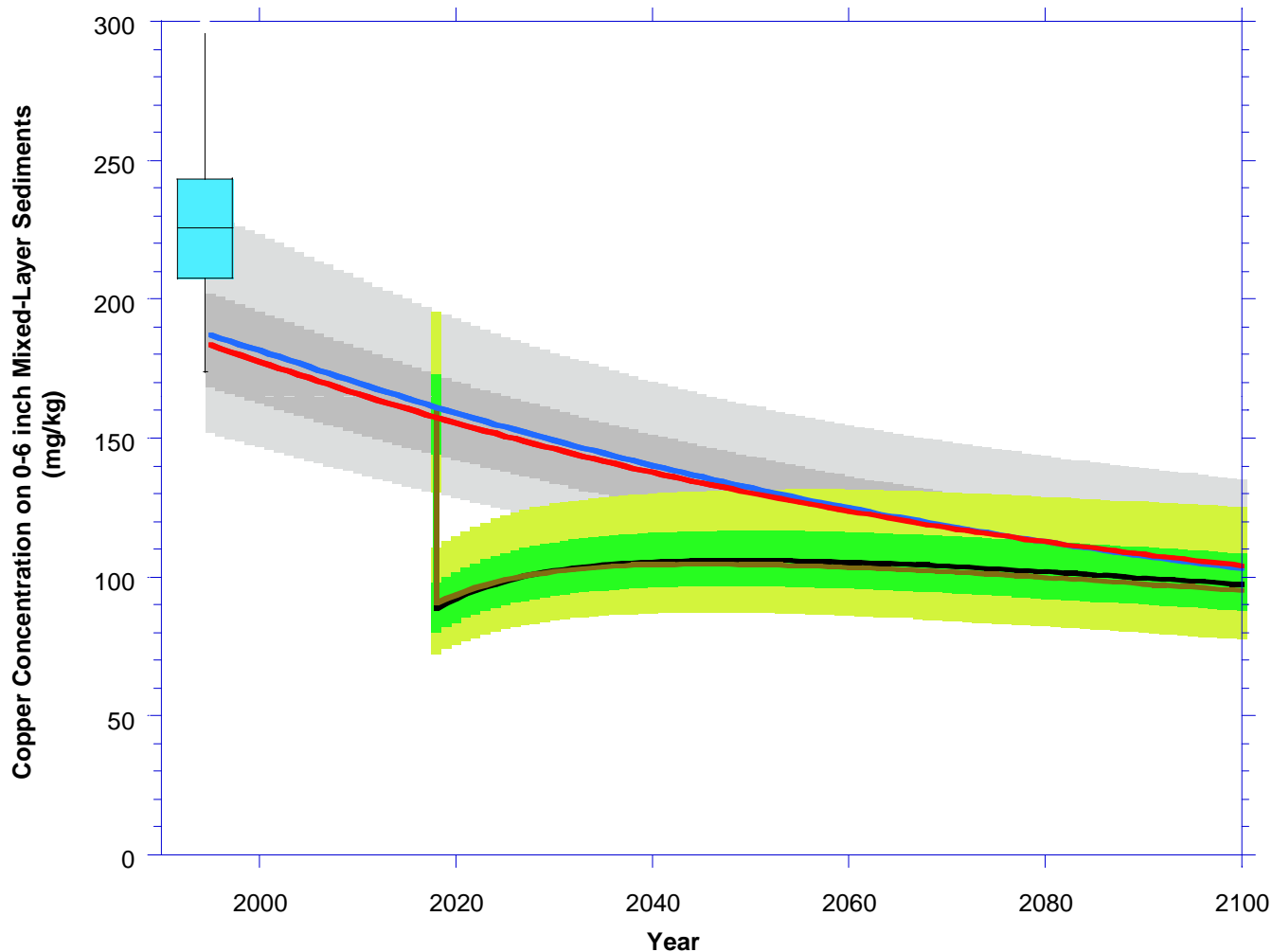
Copper - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-24A

2009

## MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone



### Legend

#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Primary Erosional Zone and Primary Inventory Zone

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

### Note

Best Estimate represents trajectory results using average input values for all parameters.



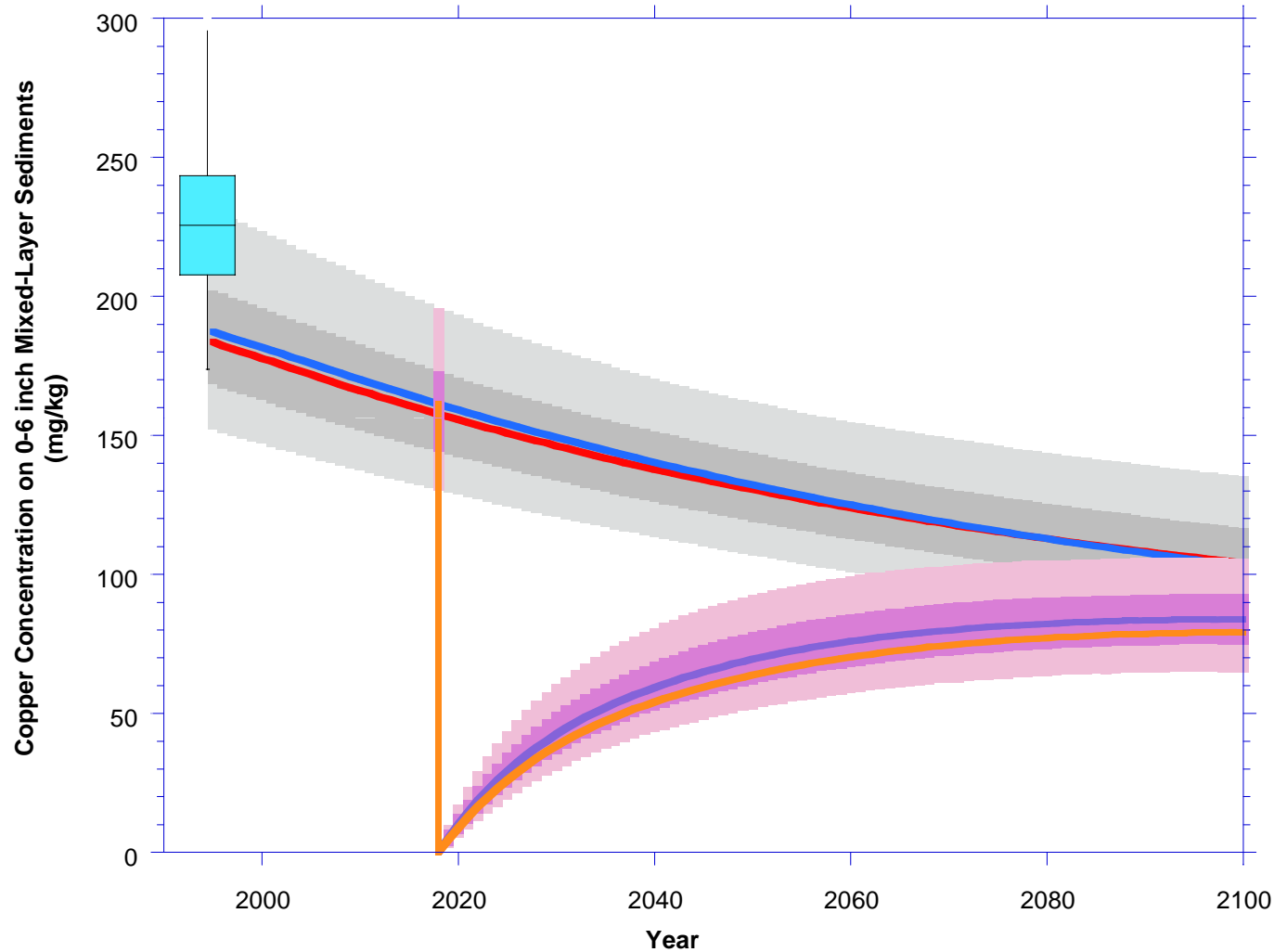
**Monte Carlo Trajectory Results for Copper Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone)**

*Lower Passaic River Restoration Project*

**Figure 20-24B**

2009

## MNR and Remediation of RM0-8



### Legend

#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### RM0-8 Remediation

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

### Note

Best Estimate represents trajectory results using average input values for all parameters.

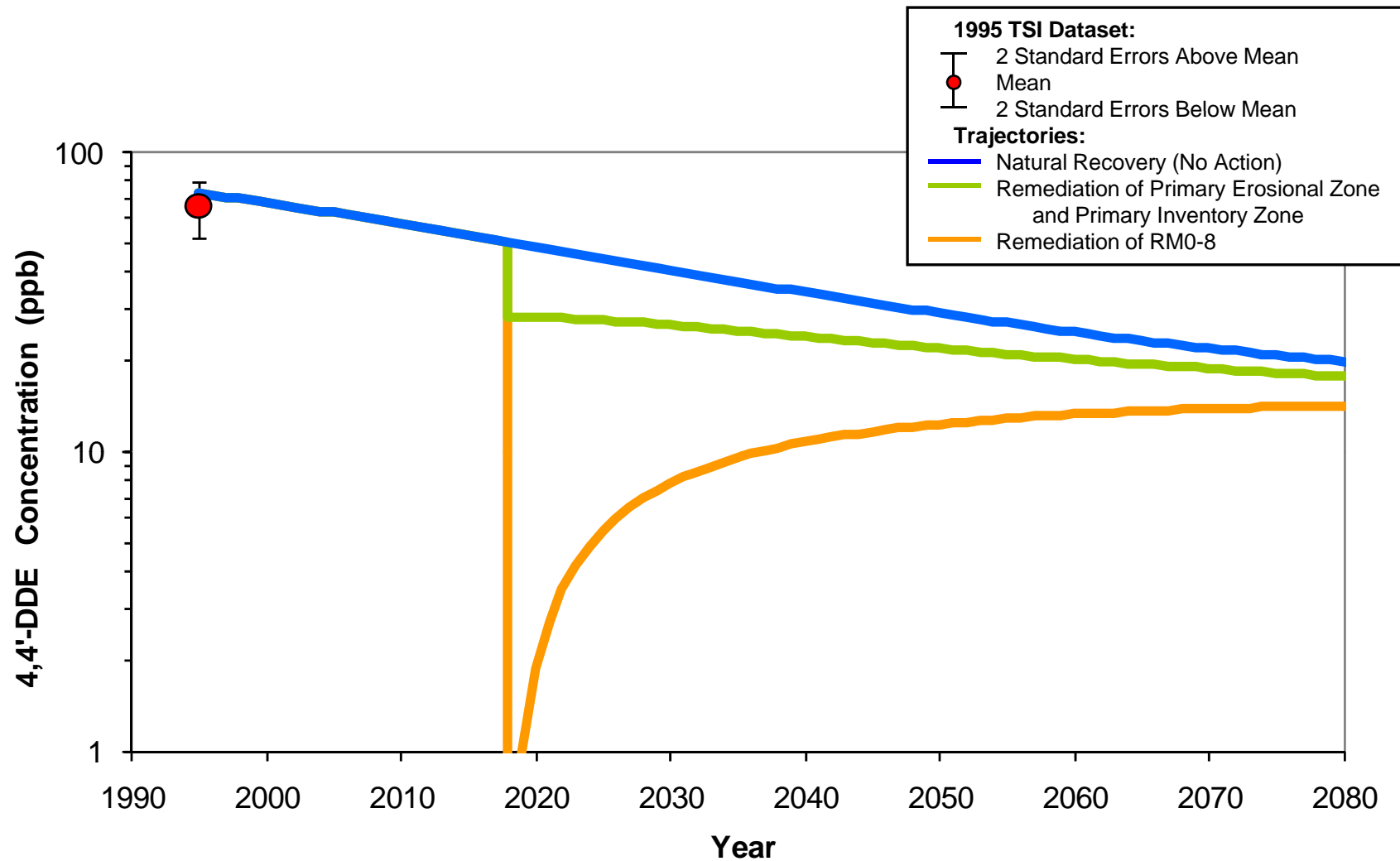


**Monte Carlo Trajectory Results for Copper Concentration in 0-6 inch Biologically Active Layer (MNR and Remediation of RM 0 to 8)**

*Lower Passaic River Restoration Project*

**Figure 20-24C**

2009



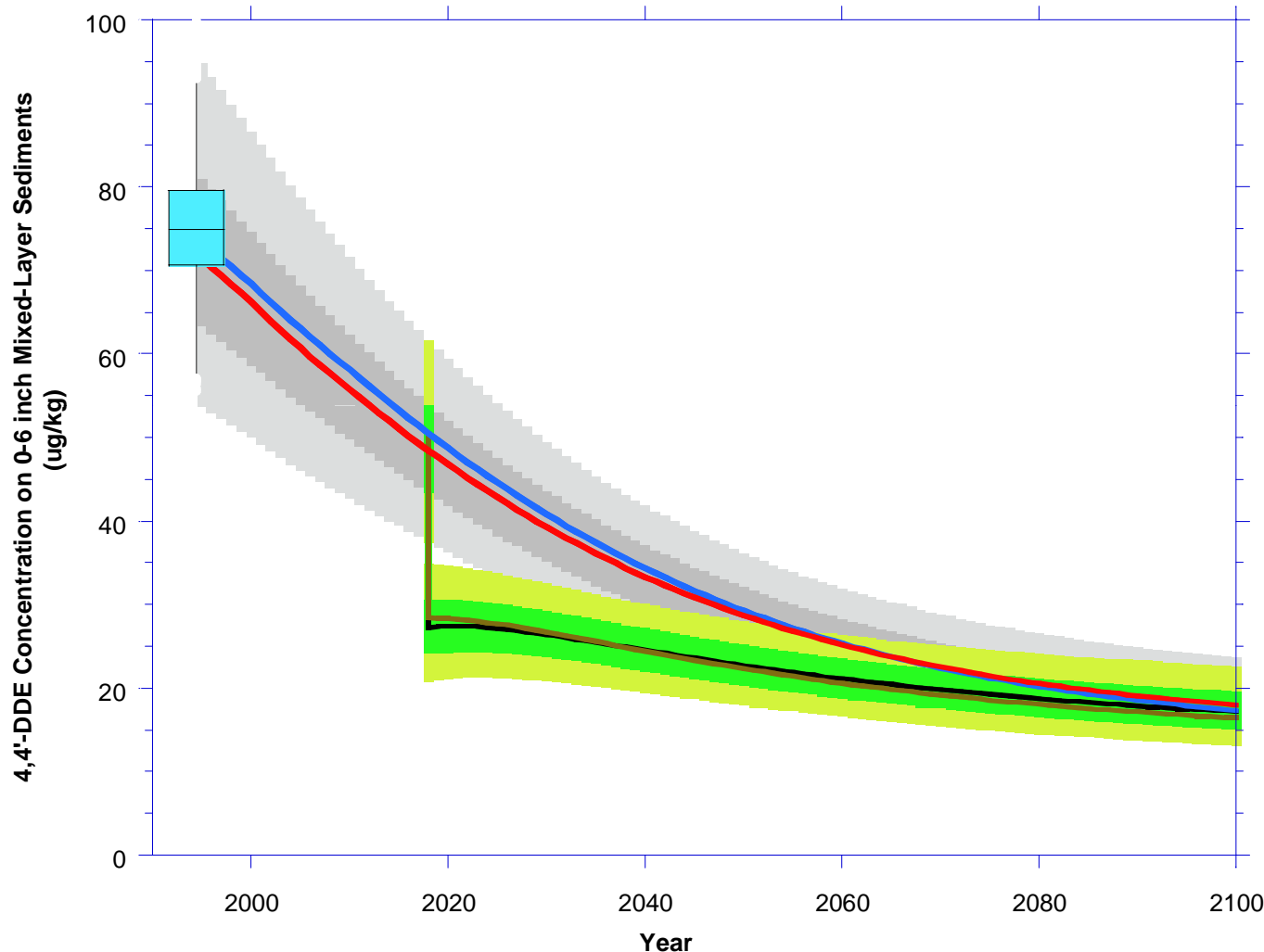
4,4'-DDE - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-25A

2009

# MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone



## Legend

### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Primary Erosional Zone and Primary Inventory Zone

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

## Note

Best Estimate represents trajectory results using average input values for all parameters.



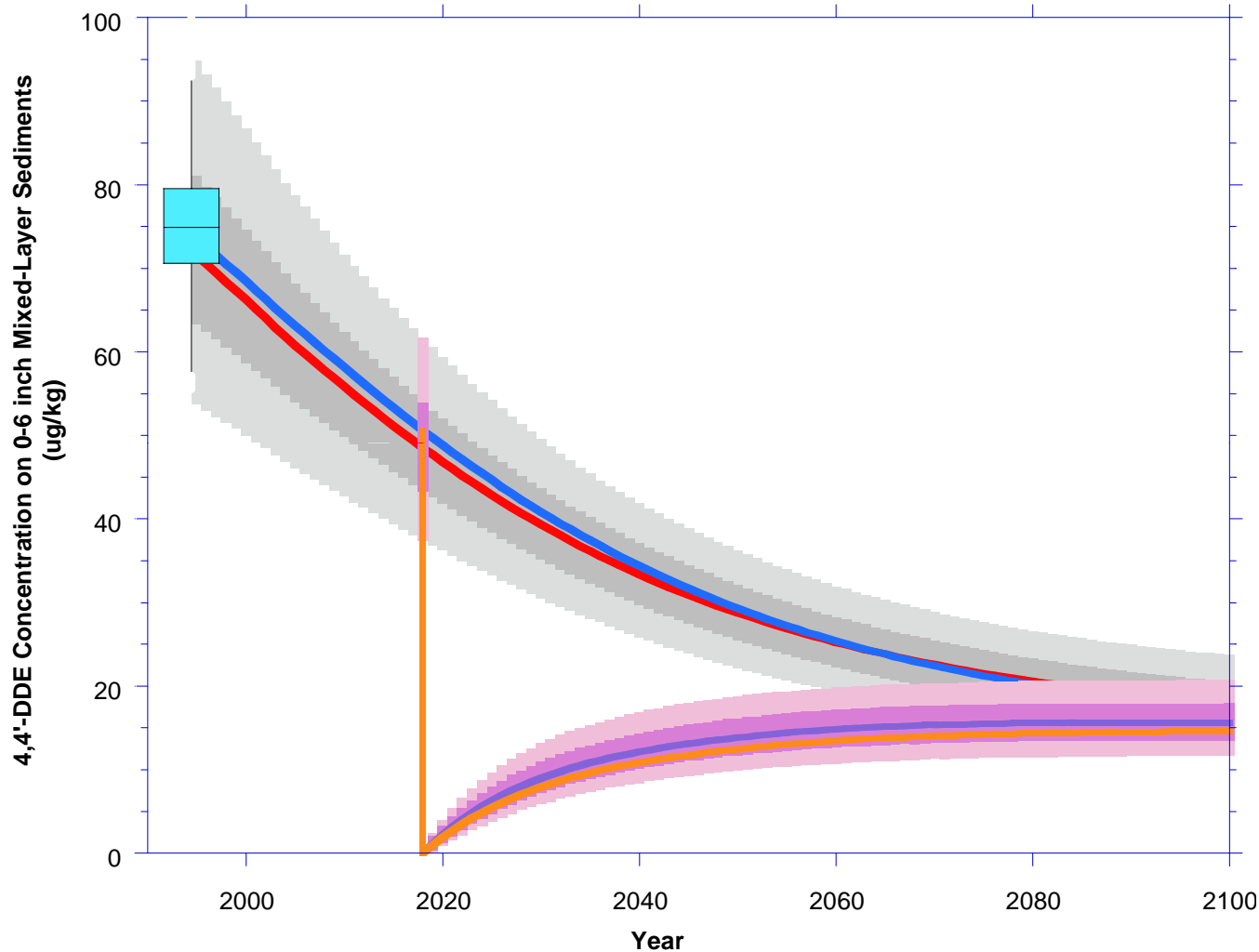
Monte Carlo Trajectory Results for 4,4'-DDE Concentration in 0-6 inch Biologically Active Layer (MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone)

Lower Passaic River Restoration Project

Figure 20-25B

2009

## MNR and Remediation of RM0-8



### Legend

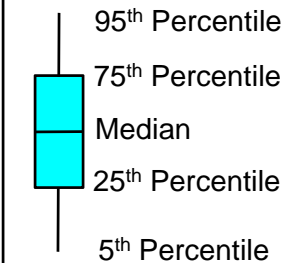
#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### RM0-8 Remediation

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration



### Note

Best Estimate represents trajectory results using average input values for all parameters.

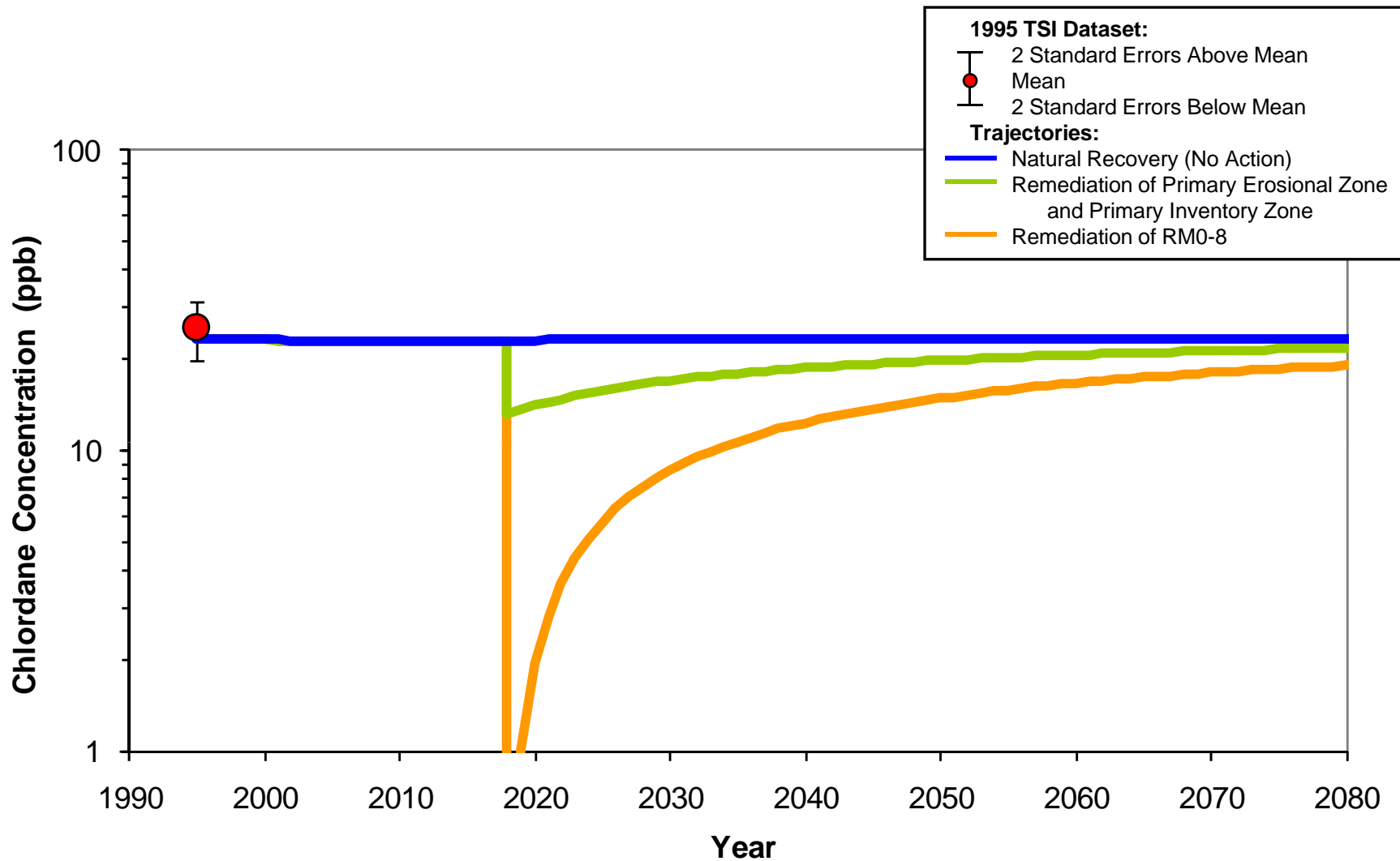


Monte Carlo Trajectory Results for 4,4'-DDE Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of RM 0 to 8)

*Lower Passaic River Restoration Project*

Figure 20-25C

2009



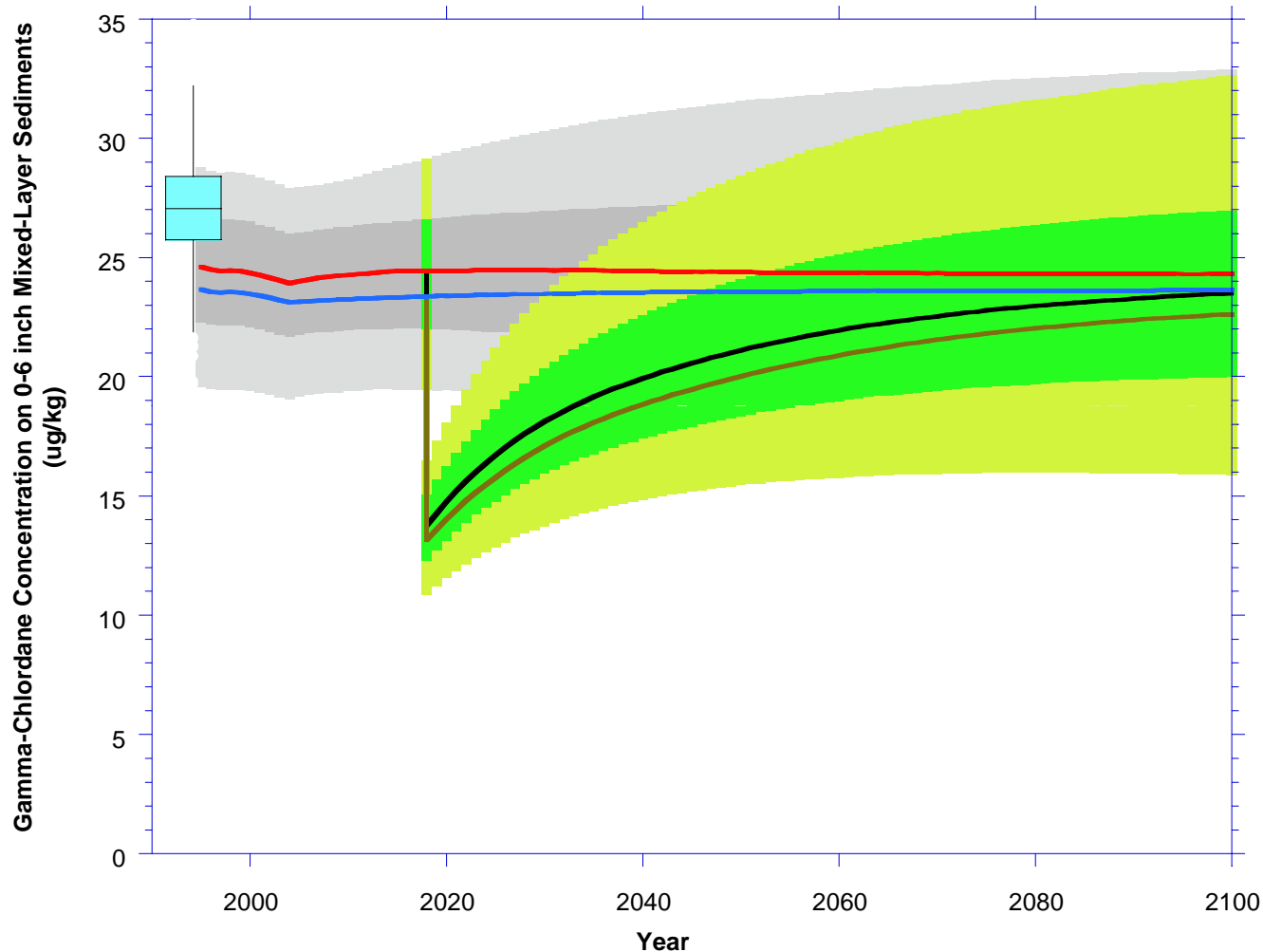
Chlordane (gamma) - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-26A

2009

# MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone



## Legend

### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Primary Erosional Zone and Primary Inventory Zone

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

## Note

Best Estimate represents trajectory results using average input values for all parameters.



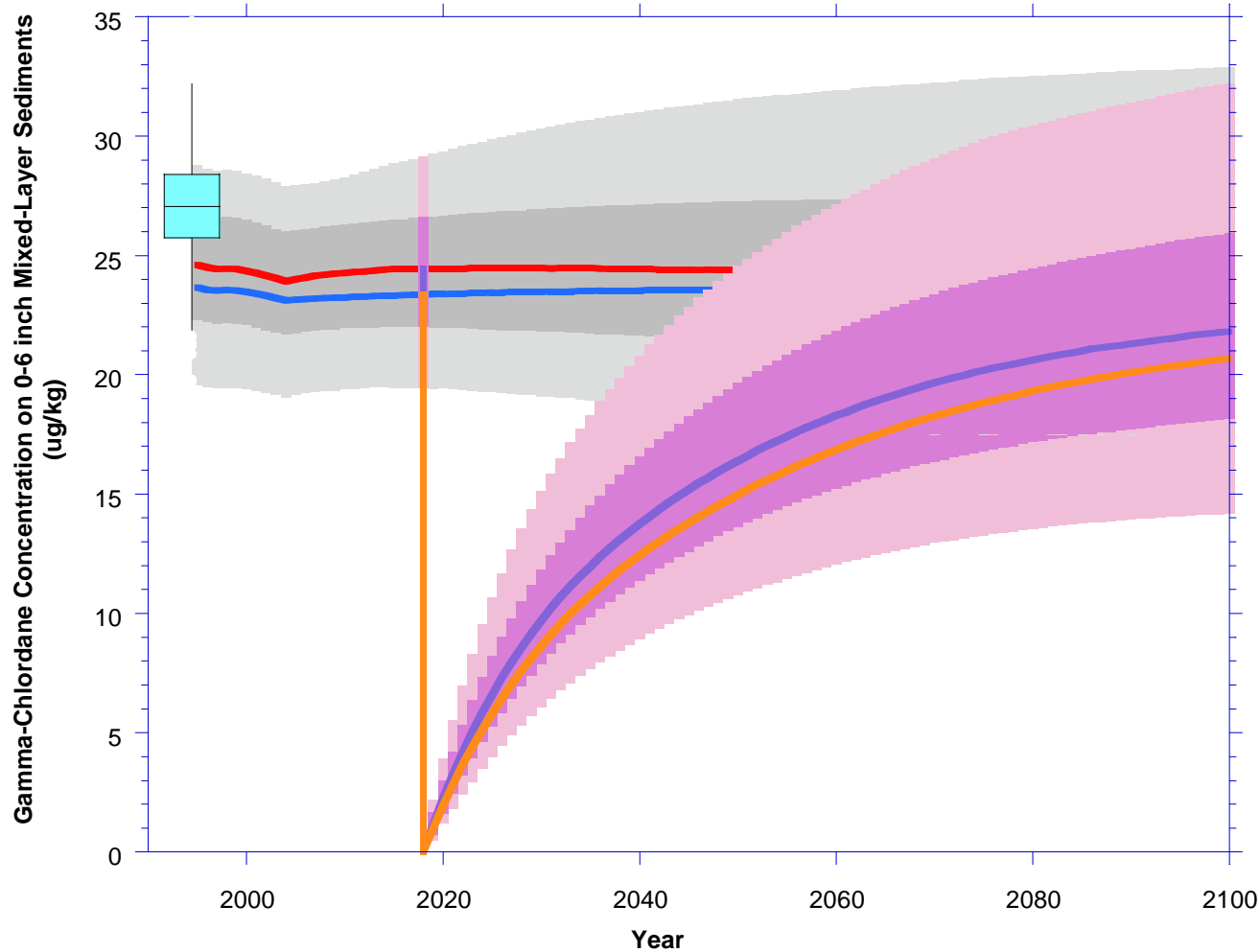
Monte Carlo Trajectory Results for gamma-Chlordane Concentration in 0-6 inch Biologically Active Layer (MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone)

Lower Passaic River Restoration Project

Figure 20-26B

2009

## MNR and Remediation of RM0-8



### Legend

#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### RM0-8 Remediation

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

### Note

Best Estimate represents trajectory results using average input values for all parameters.

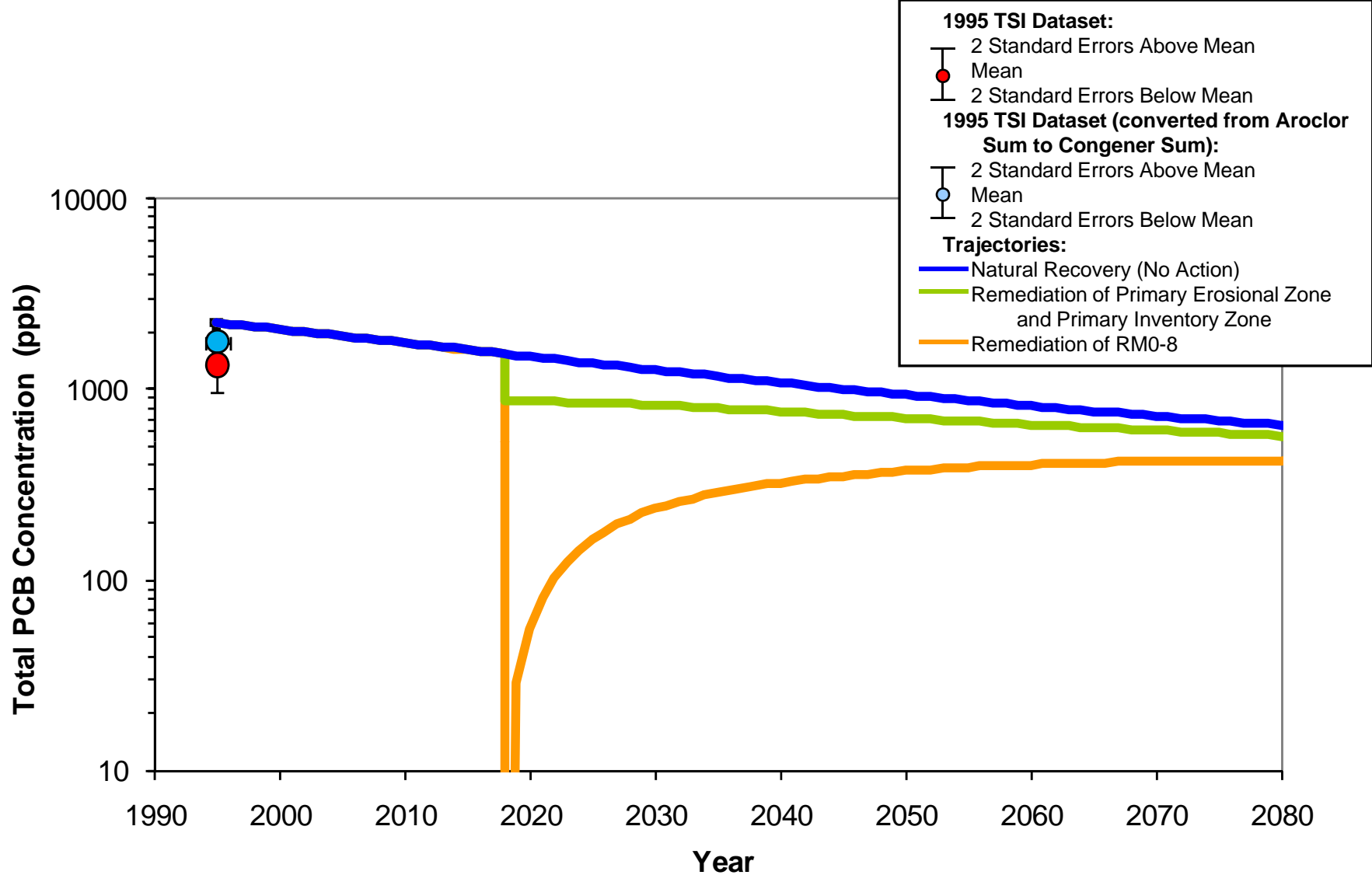


Monte Carlo Trajectory Results for gamma-Chlordane Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of RM 0 to 8)

Lower Passaic River Restoration Project

Figure 20-26C

2009



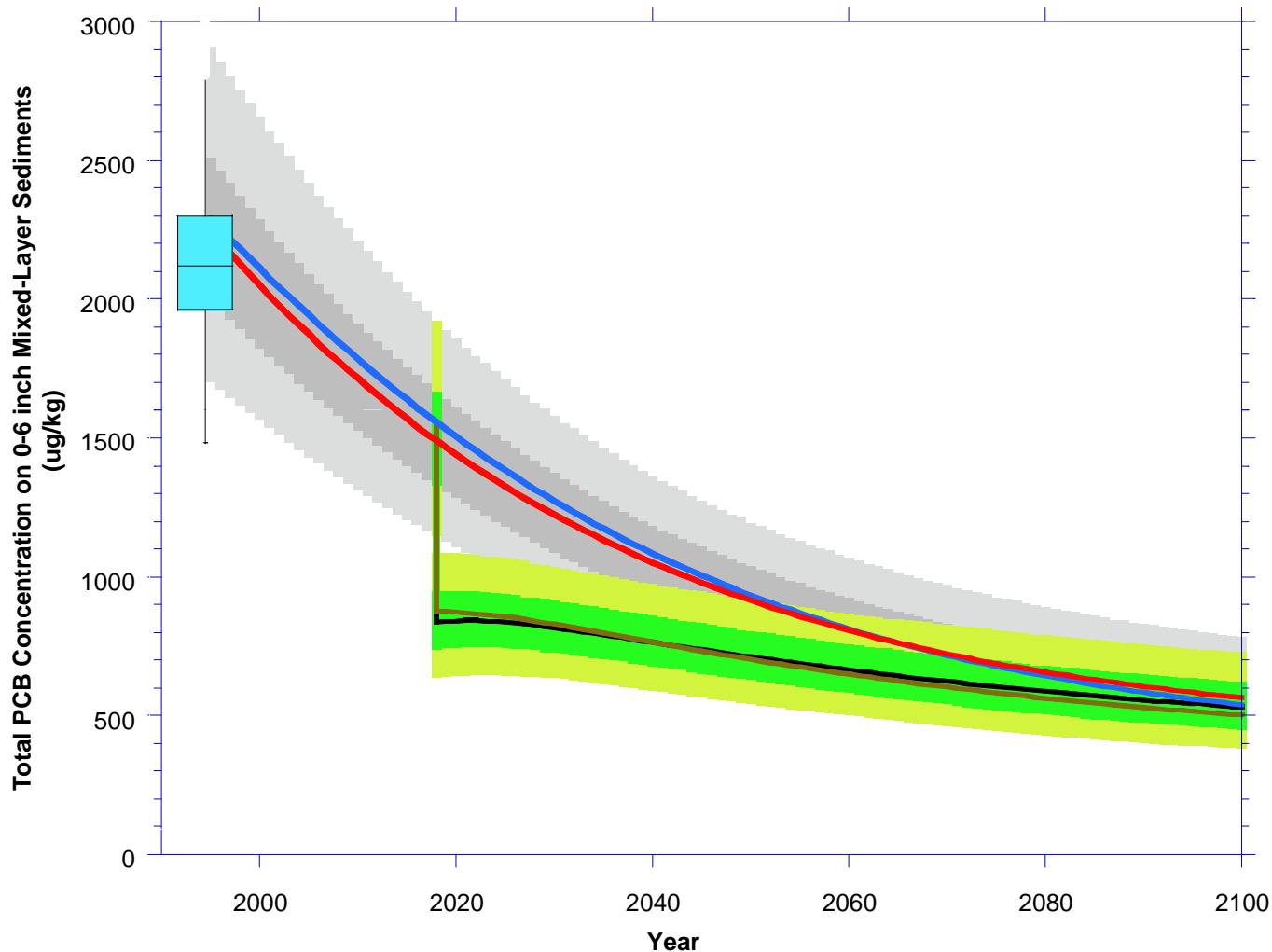
**Total PCB - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer**

*Lower Passaic River Restoration Project*

**Figure 20-27A**

2009

# MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone



## Legend

### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Primary Erosional Zone and Primary Inventory Zone

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

## Note

Best Estimate represents trajectory results using average input values for all parameters.



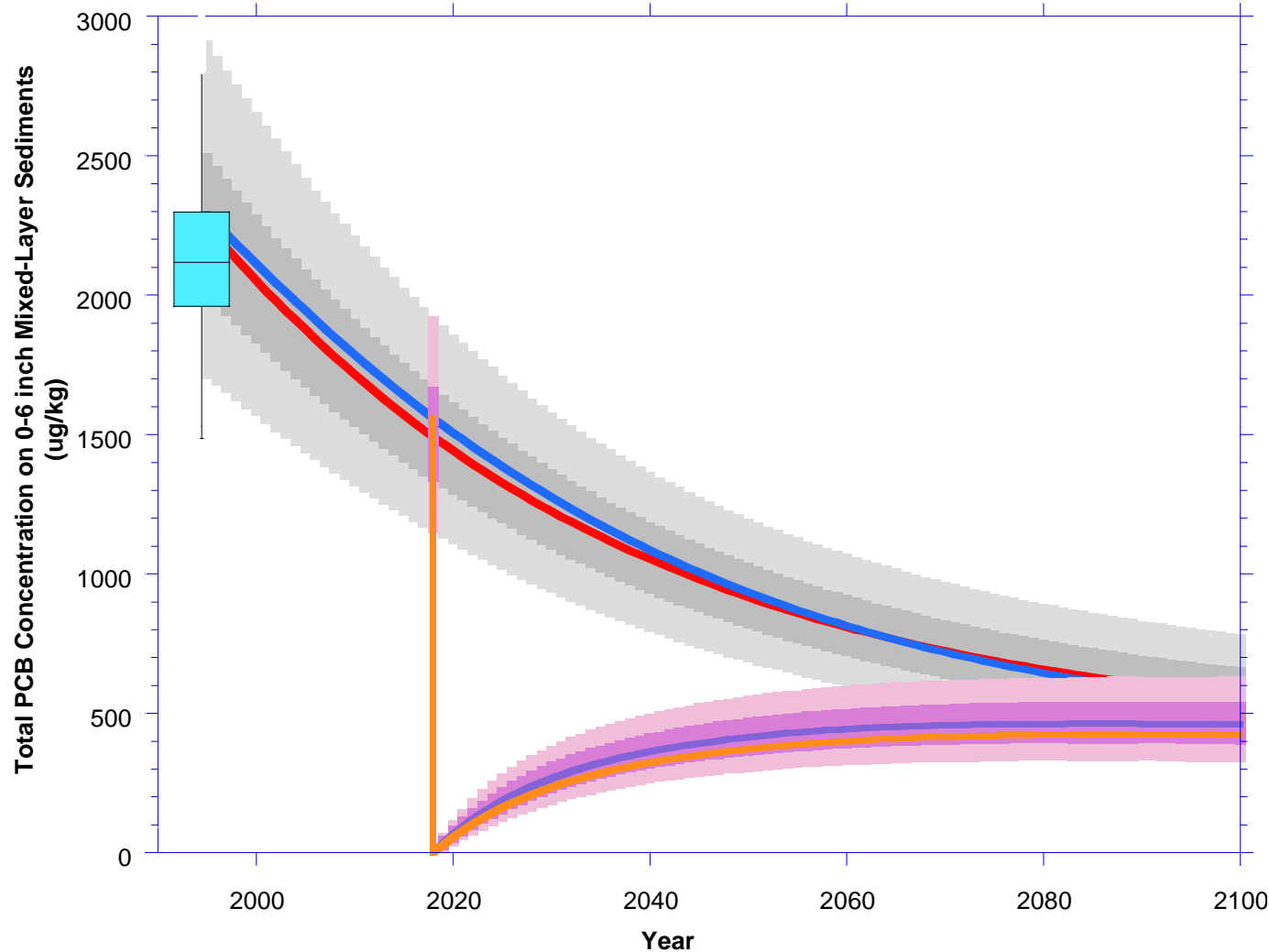
Monte Carlo Trajectory Results for Total PCB Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of Primary Erosional Zone and Primary Inventory Zone)

Lower Passaic River Restoration Project

Figure 20-27B

2009

## MNR and Remediation of RM0-8



### Legend

#### MNR

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### RM0-8 Remediation

- Best Estimate
- Median
- 25<sup>th</sup> to 75<sup>th</sup> Percentile
- 5<sup>th</sup> to 95<sup>th</sup> Percentile

#### Distribution of the 1995 Mixed Layer Mean Concentration

- 95<sup>th</sup> Percentile
- 75<sup>th</sup> Percentile
- Median
- 25<sup>th</sup> Percentile
- 5<sup>th</sup> Percentile

### Note

Best Estimate represents trajectory results using average input values for all parameters.

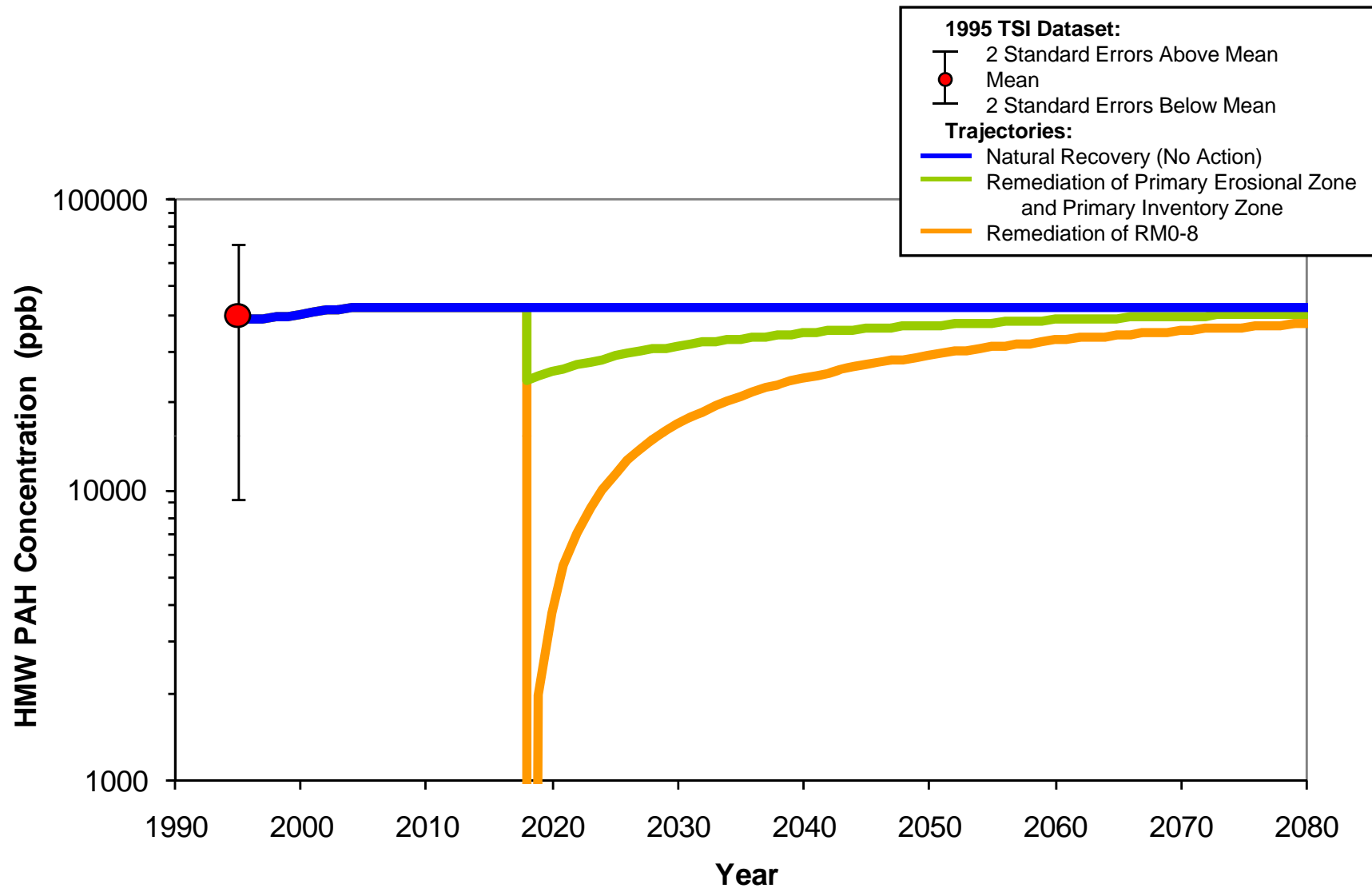


Monte Carlo Trajectory Results for Total PCB Concentration in  
0-6 inch Biologically Active Layer  
(MNR and Remediation of RM 0 to 8)

Lower Passaic River Restoration Project

Figure 20-27C

2009

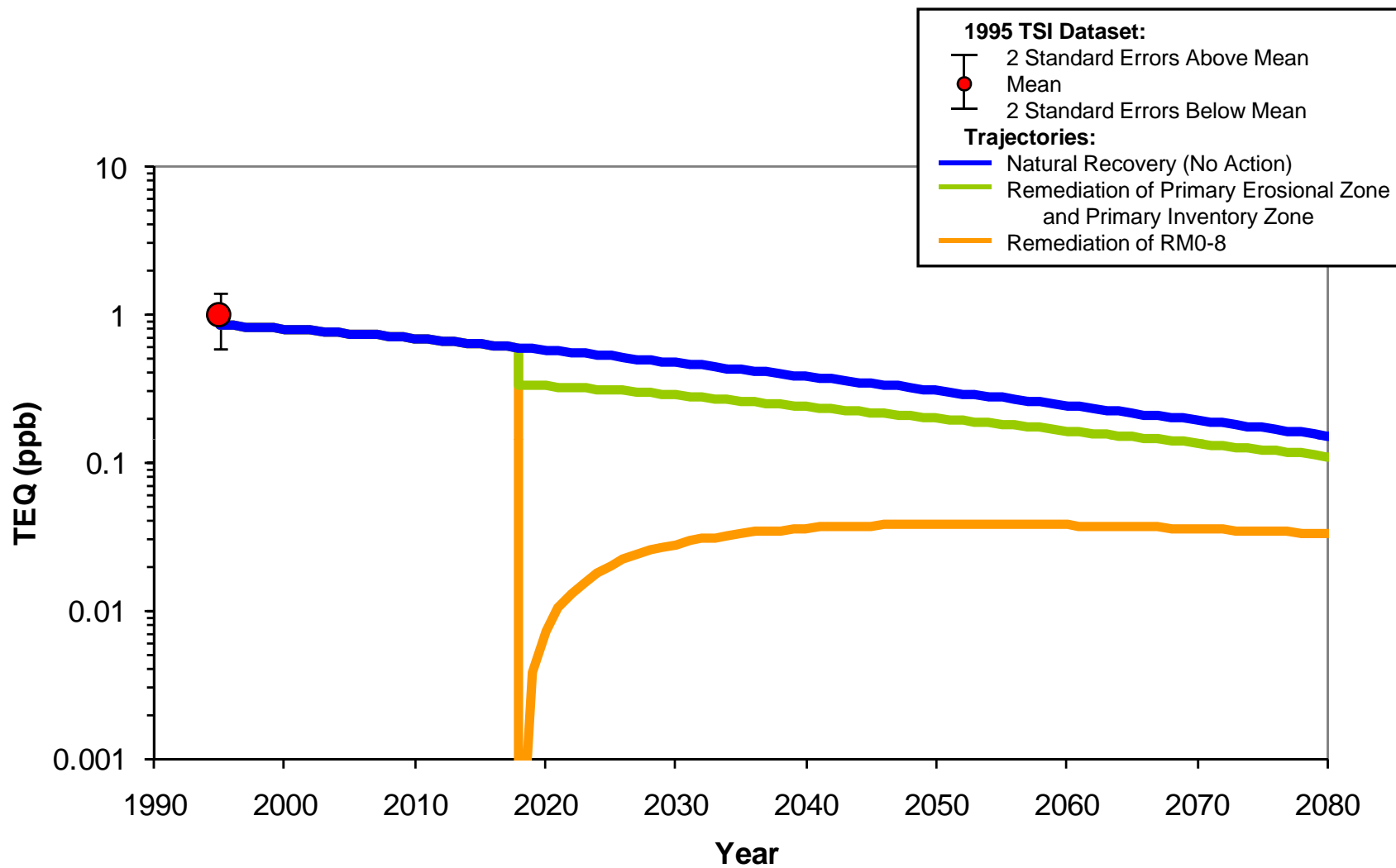


HMW PAH - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-28

2009

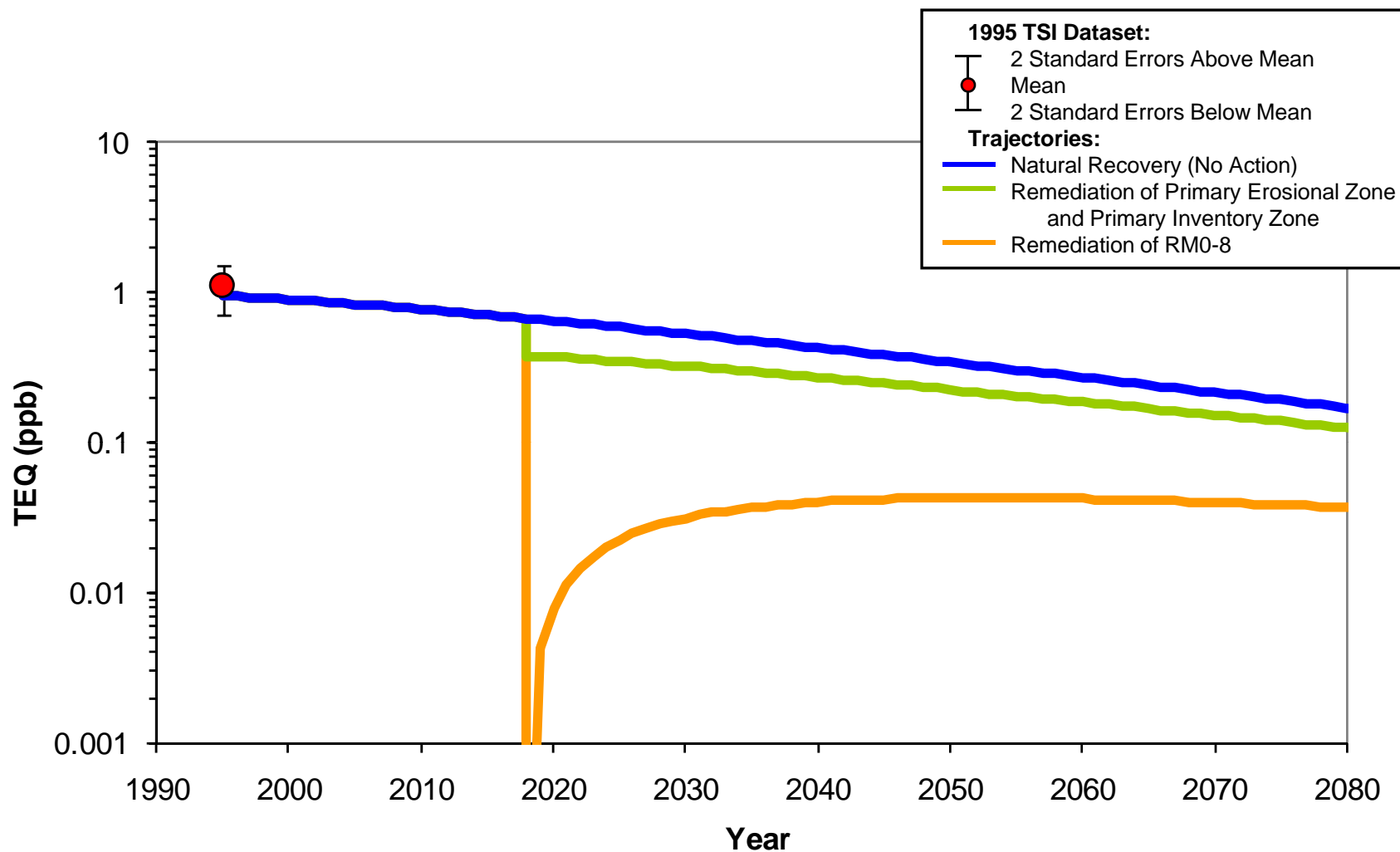


Dioxin/Furan TEQ (Fish) - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-29

2009

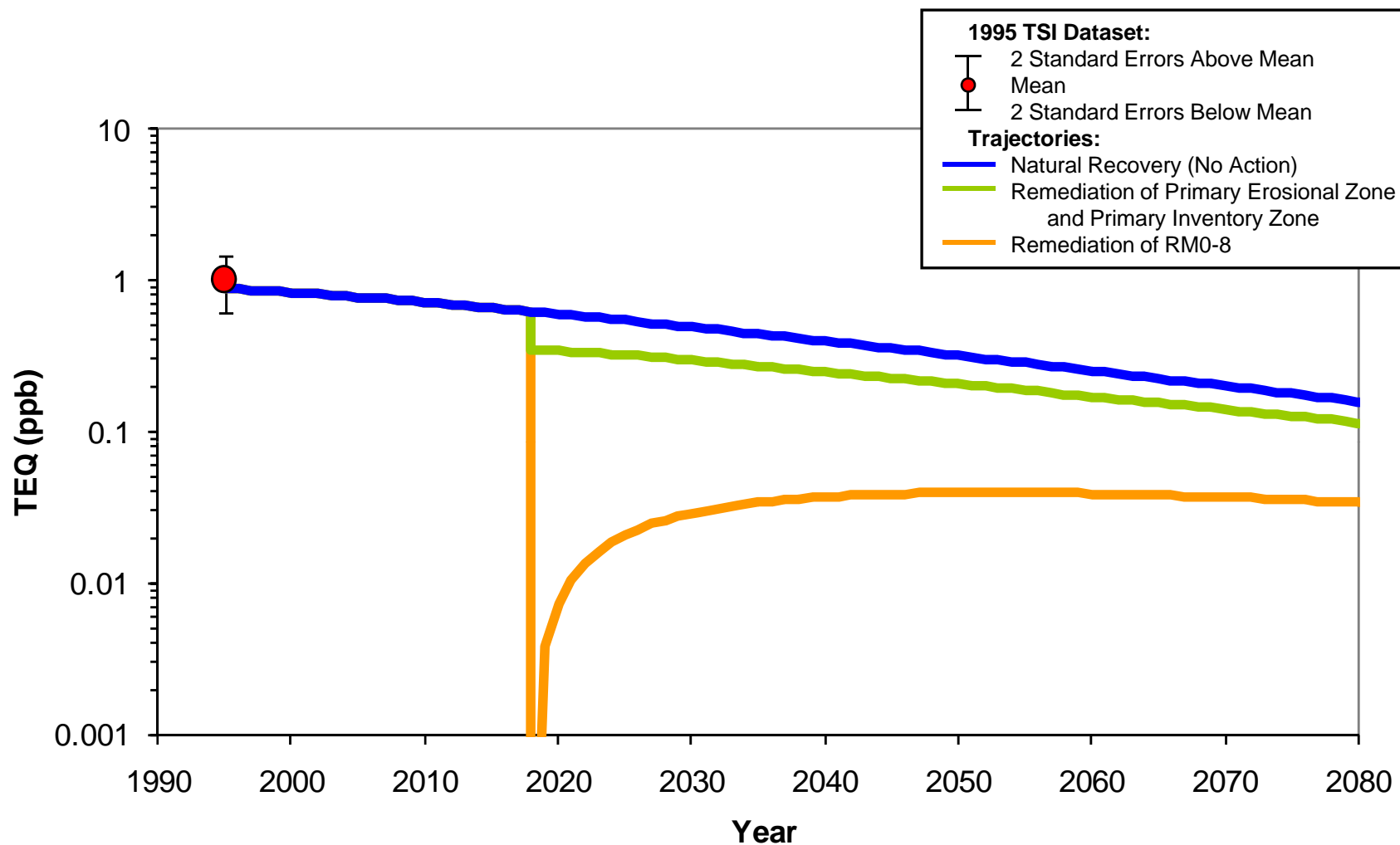


Dioxin/Furan TEQ (Bird) - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-30

2009

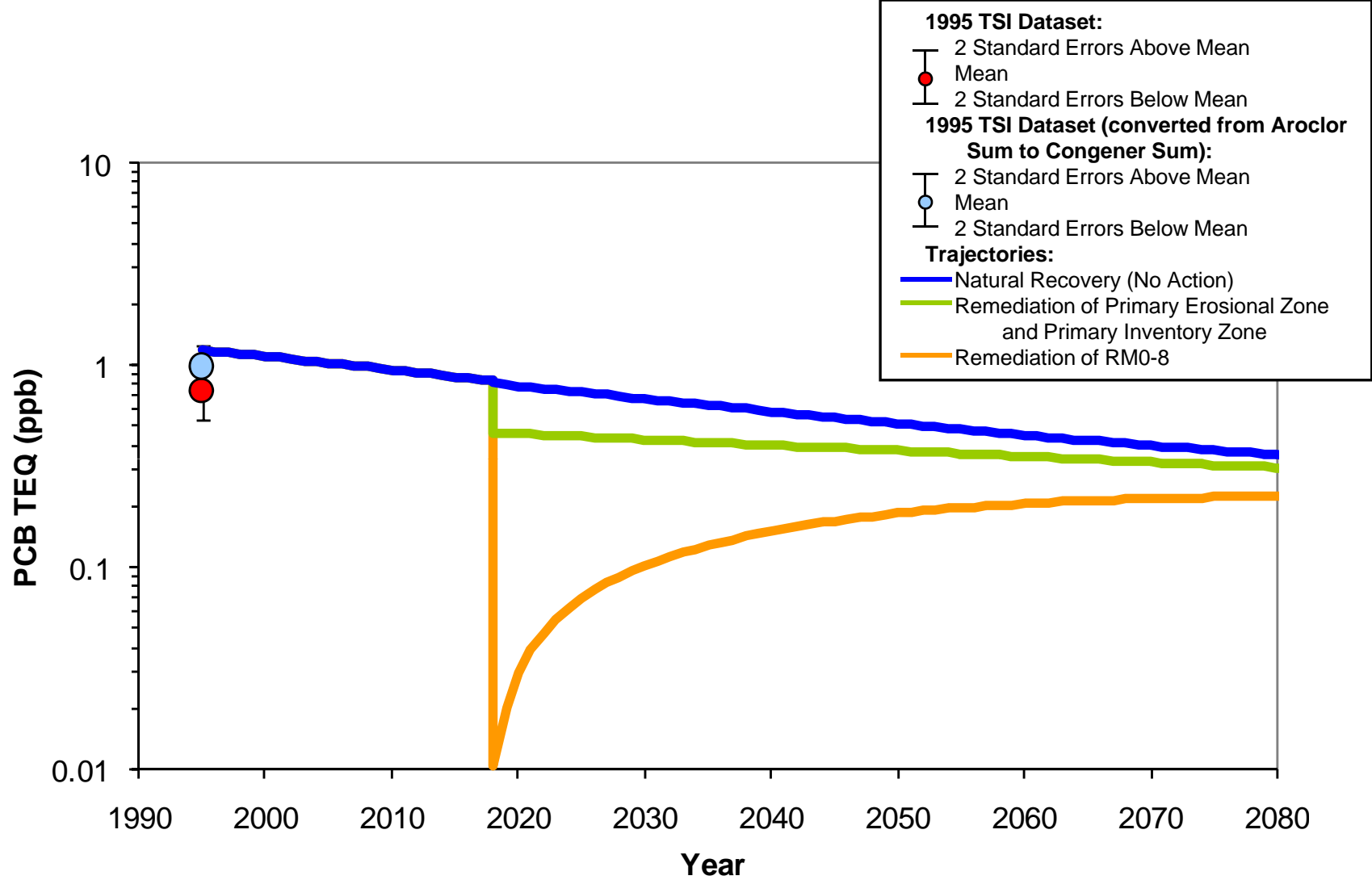


**Dioxin/Furan TEQ (Mammal) - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer**

*Lower Passaic River Restoration Project*

**Figure 20-31**

2009

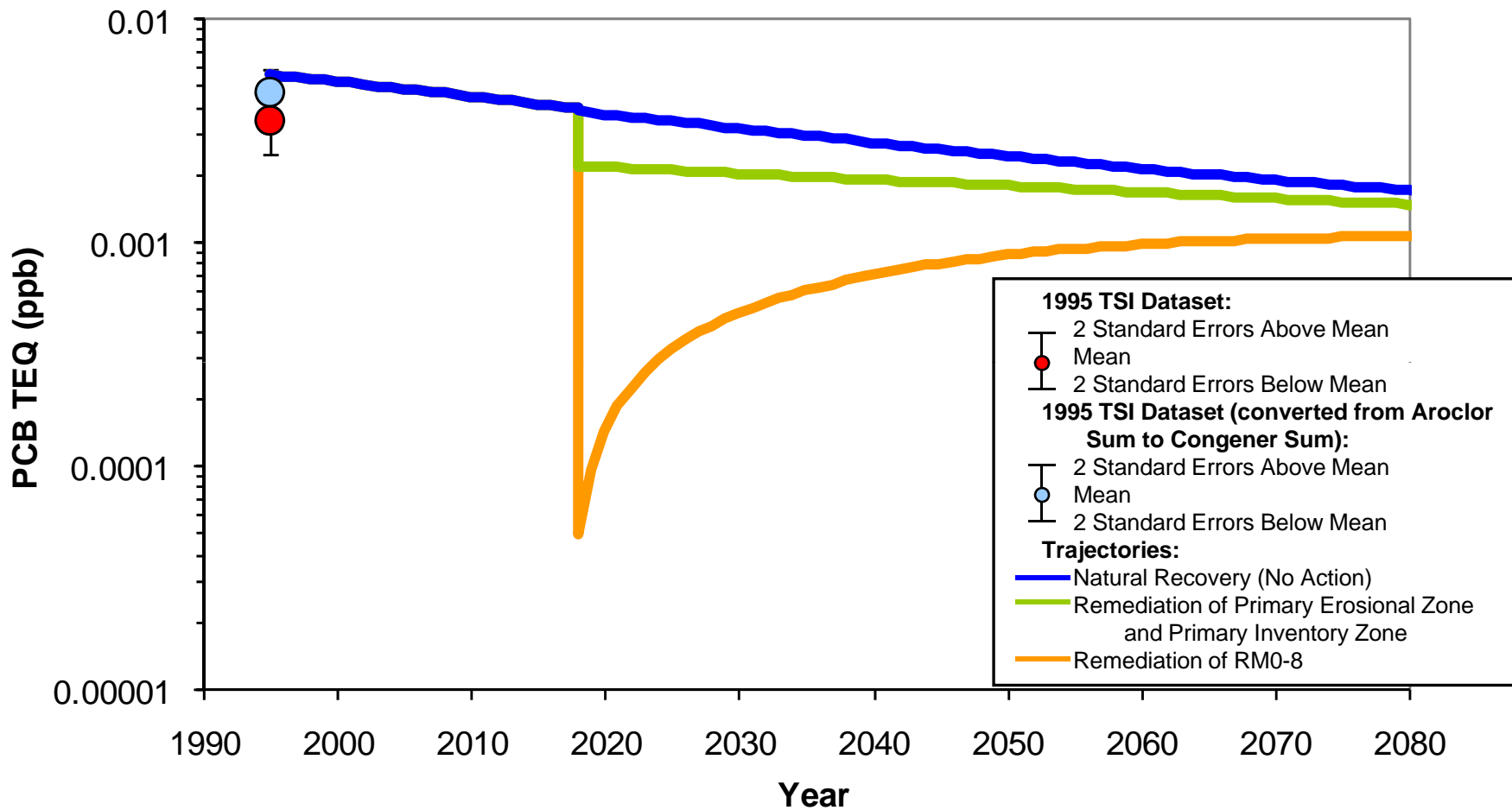


**PCB TEQ (Fish) - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer**

*Lower Passaic River Restoration Project*

**Figure 20-32**

2009

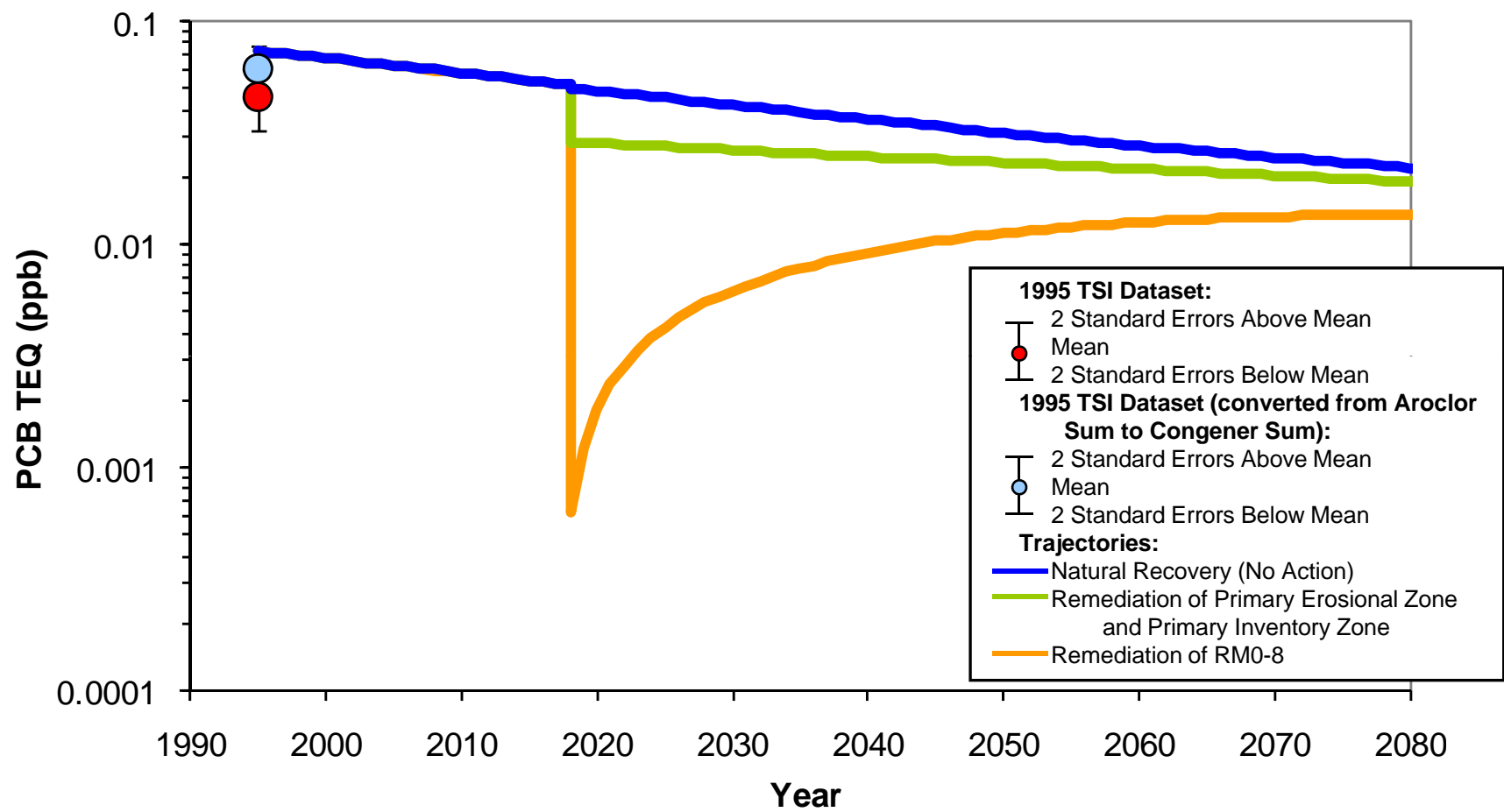


PCB TEQ (Bird) - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

Lower Passaic River Restoration Project

Figure 20-33

2009



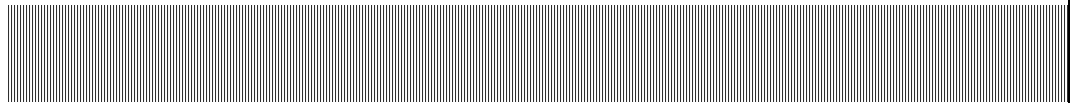
PCB TEQ (Mammal) - Comparison of Best Estimate Trajectories for Concentration in 0-6 inch Biologically Active Layer

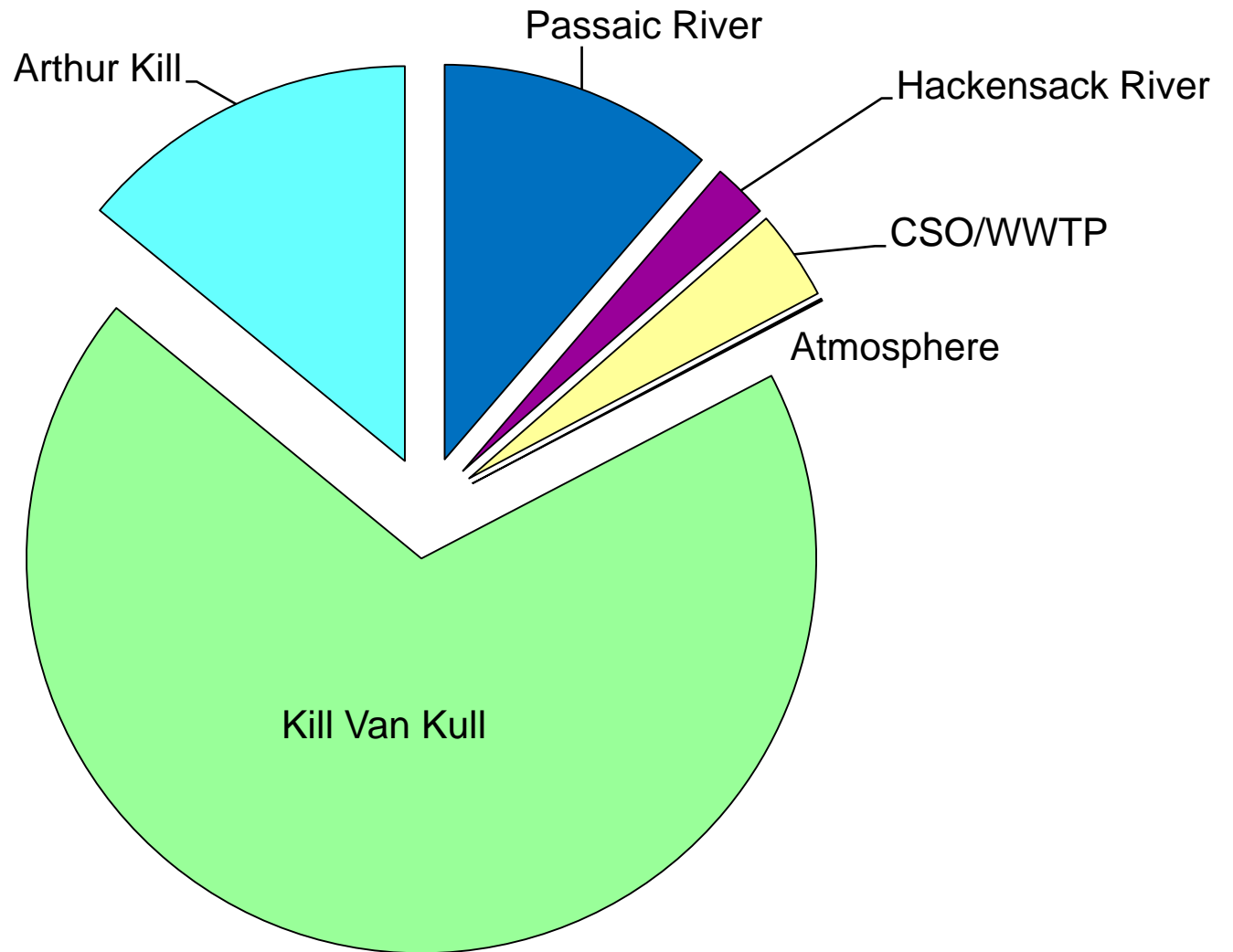
Figure 20-34

2009

Lower Passaic River Restoration Project

## Chapter 21 Figures



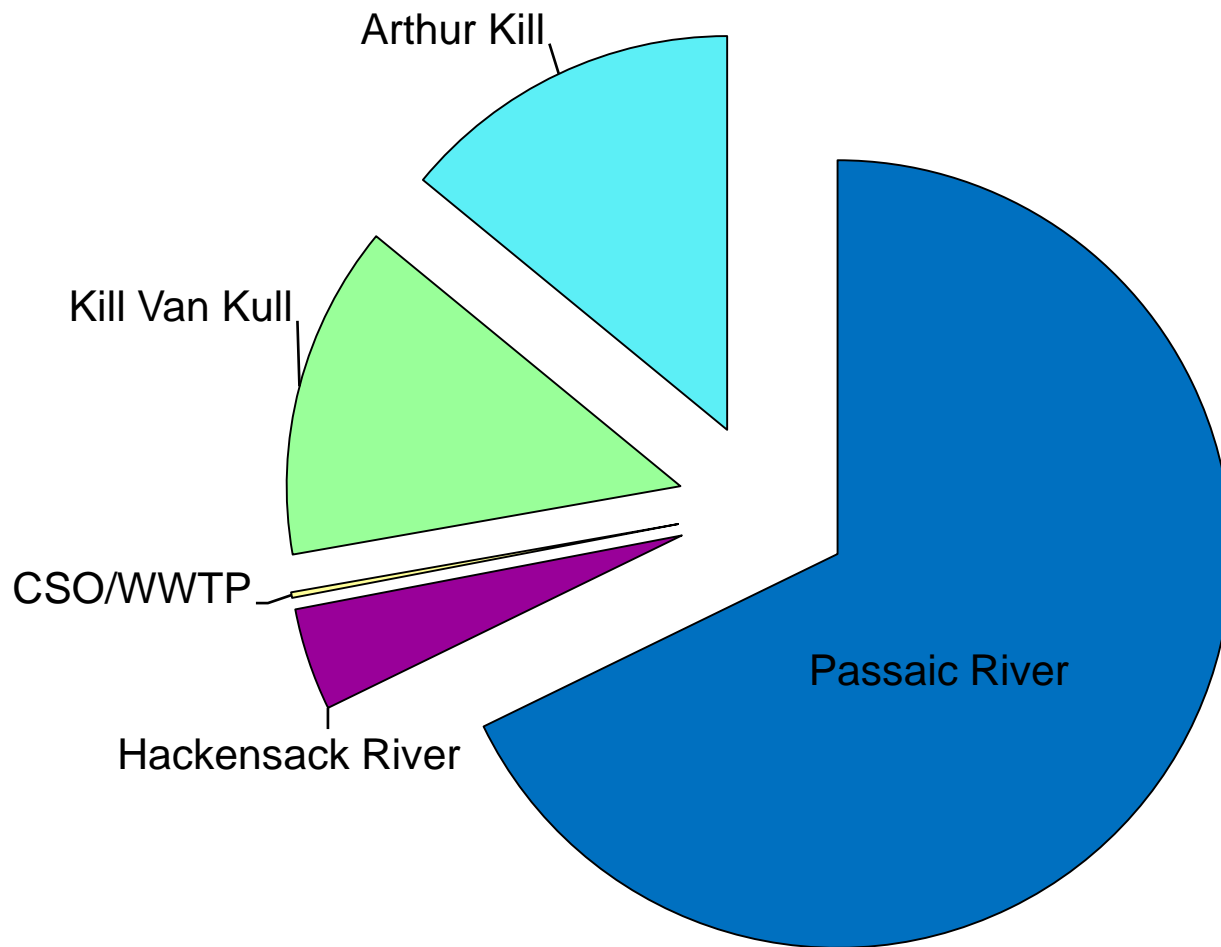


Solids Mass Balance for Newark Bay

*Lower Passaic River Restoration Project*

Figure 21-1

September 2008

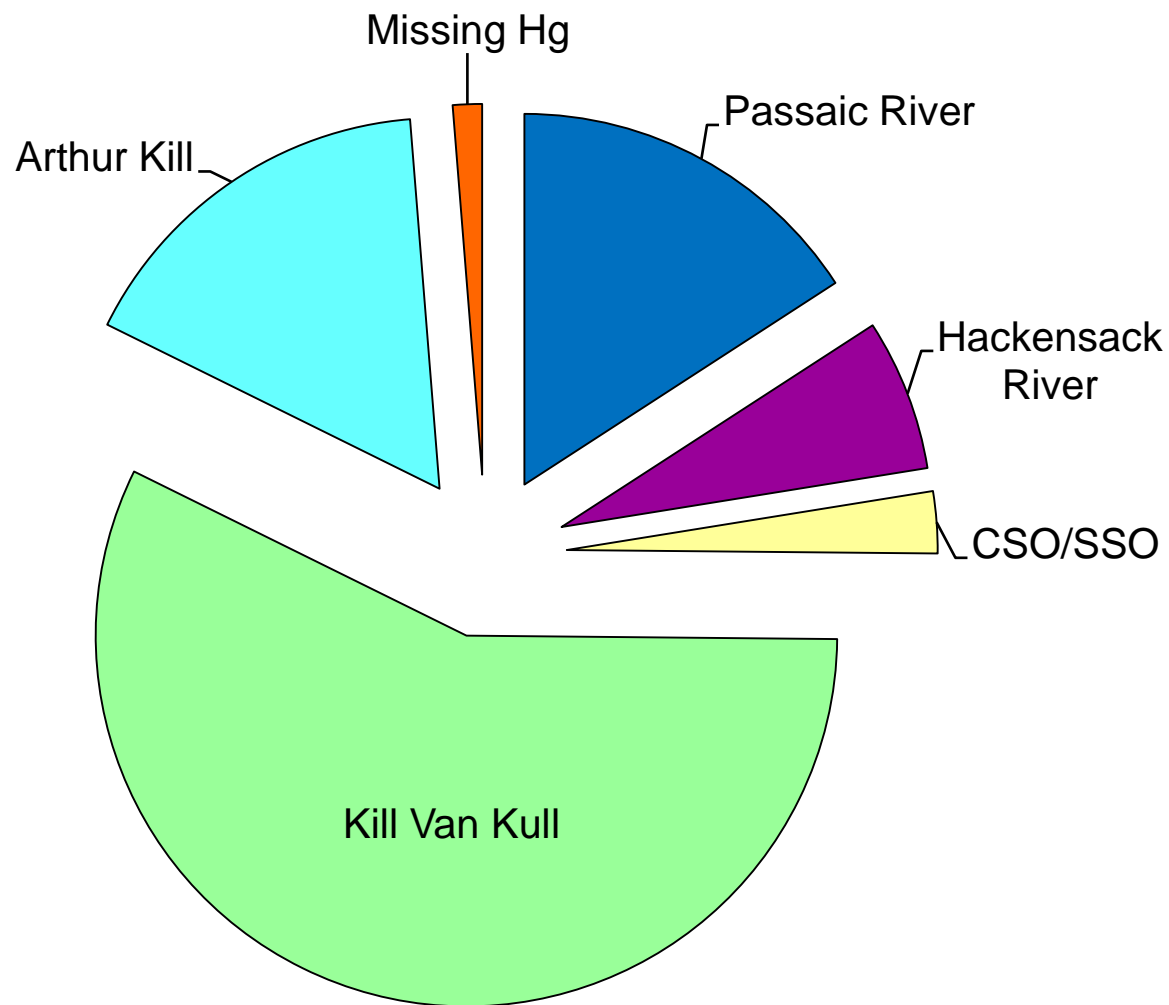


2,3,7,8-TCDD Mass Balance for Newark Bay

*Lower Passaic River Restoration Project*

Figure 21-2

September 2008



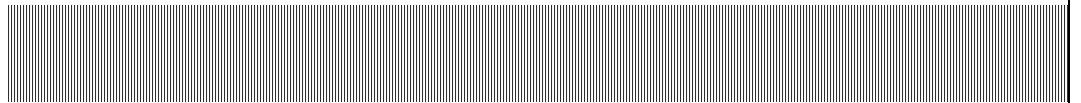
Mercury Mass Balance for Newark Bay

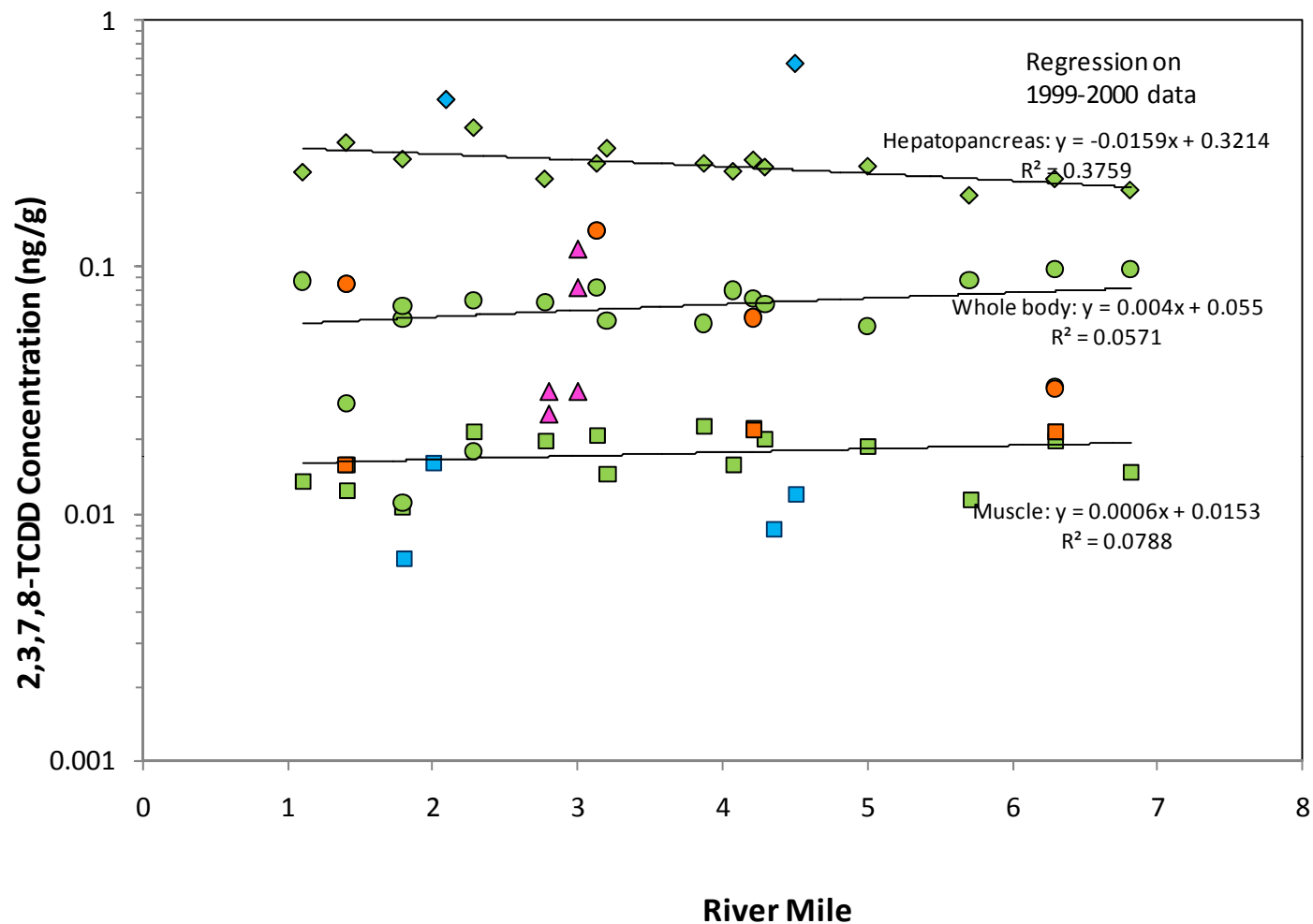
*Lower Passaic River Restoration Project*

Figure 21-3

September 2008

## Chapter 22 Figures





- ◆ 1995 Hepatopancreas
- ◆ 1999 Hepatopancreas
- 1995 Muscle
- 1999 Muscle
- 2000 Muscle
- 1999 Whole Body
- 2000 Whole Body
- ▲ 1999 CARP

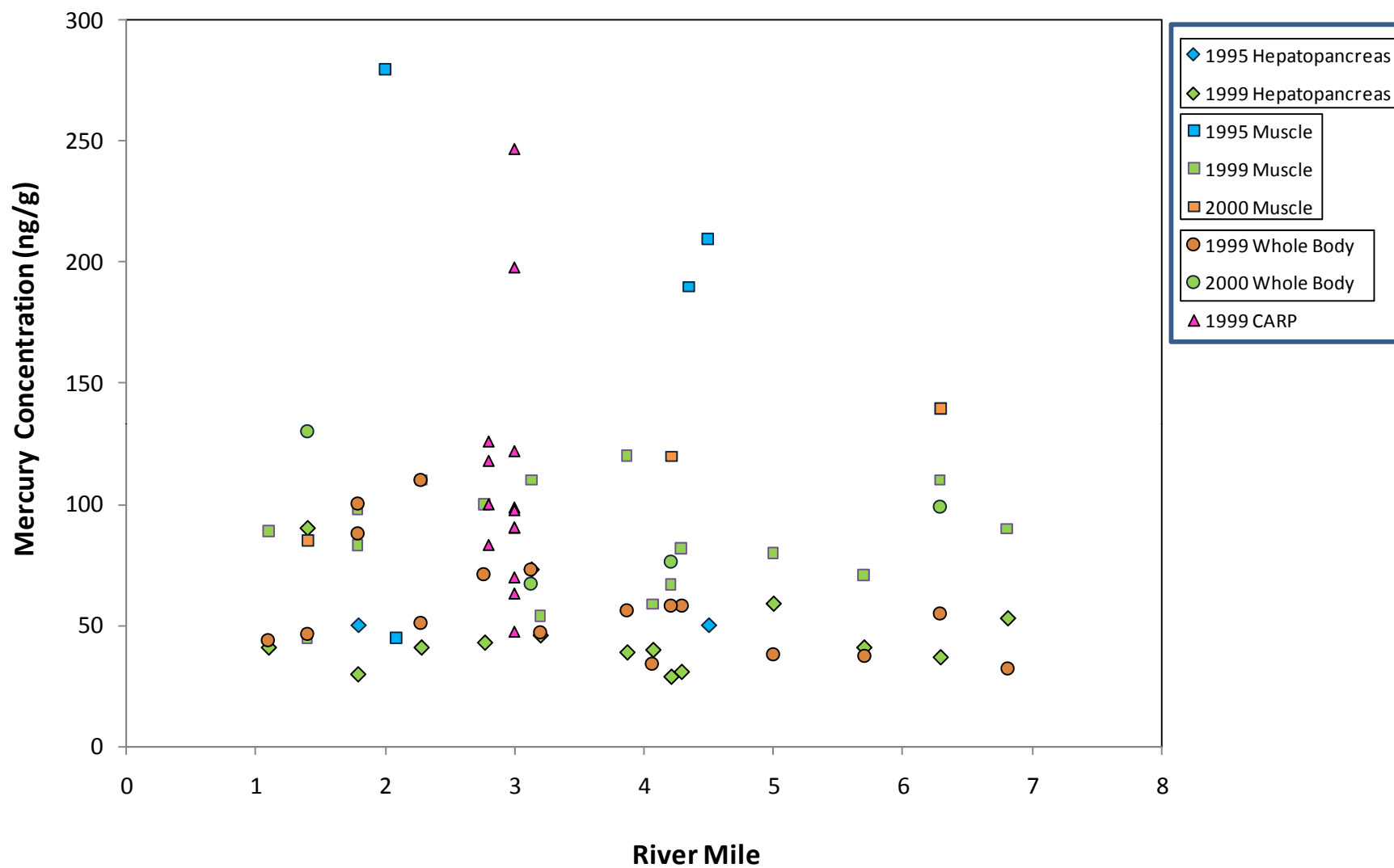


2,3,7,8-TCDD Concentration in Blue Crab Tissue vs. River Mile

Lower Passaic River Restoration Project

Figure 22-1

2009

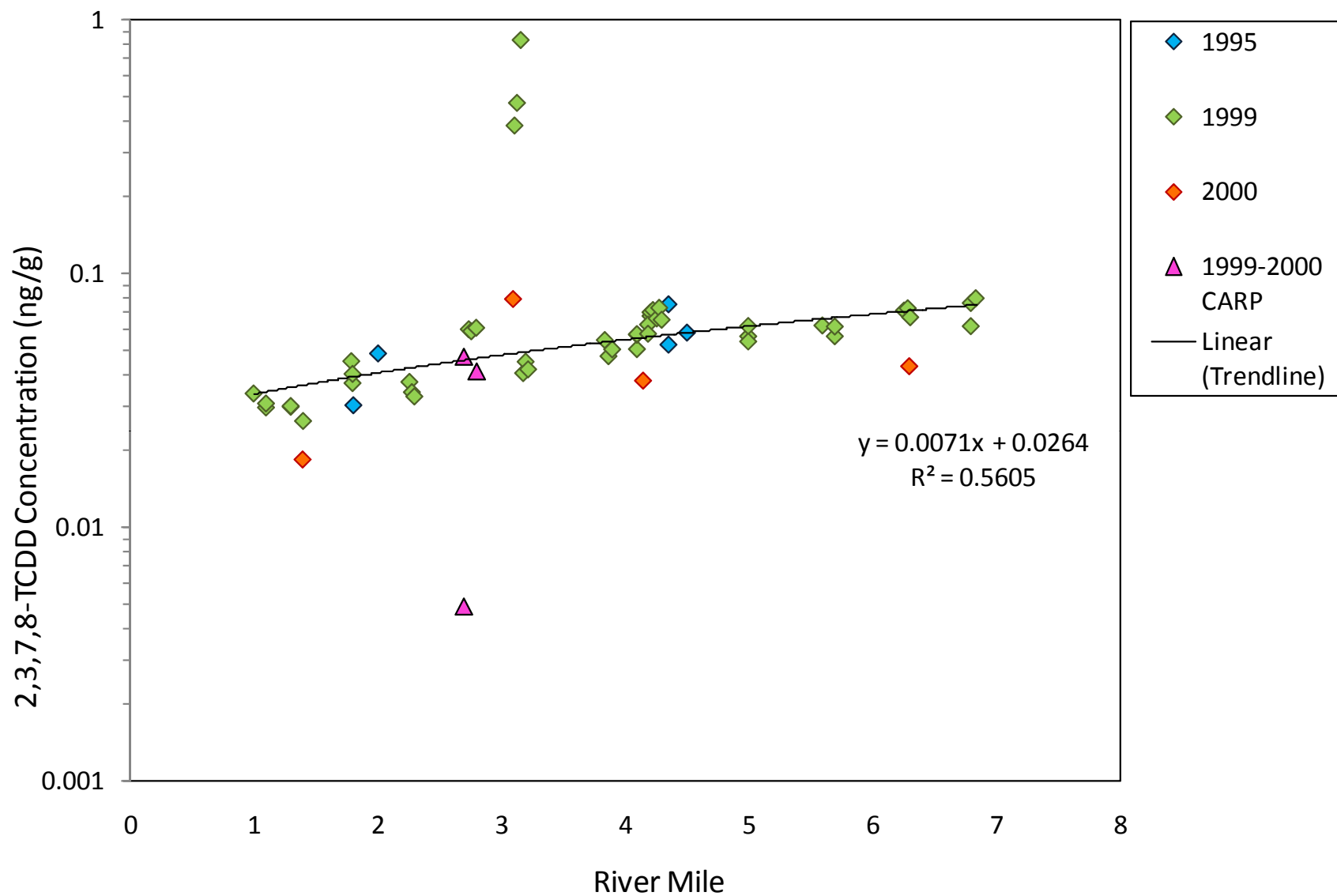


Mercury Concentration in Blue Crab Tissue vs. River Mile

Lower Passaic River Restoration Project

Figure 22-2

2009

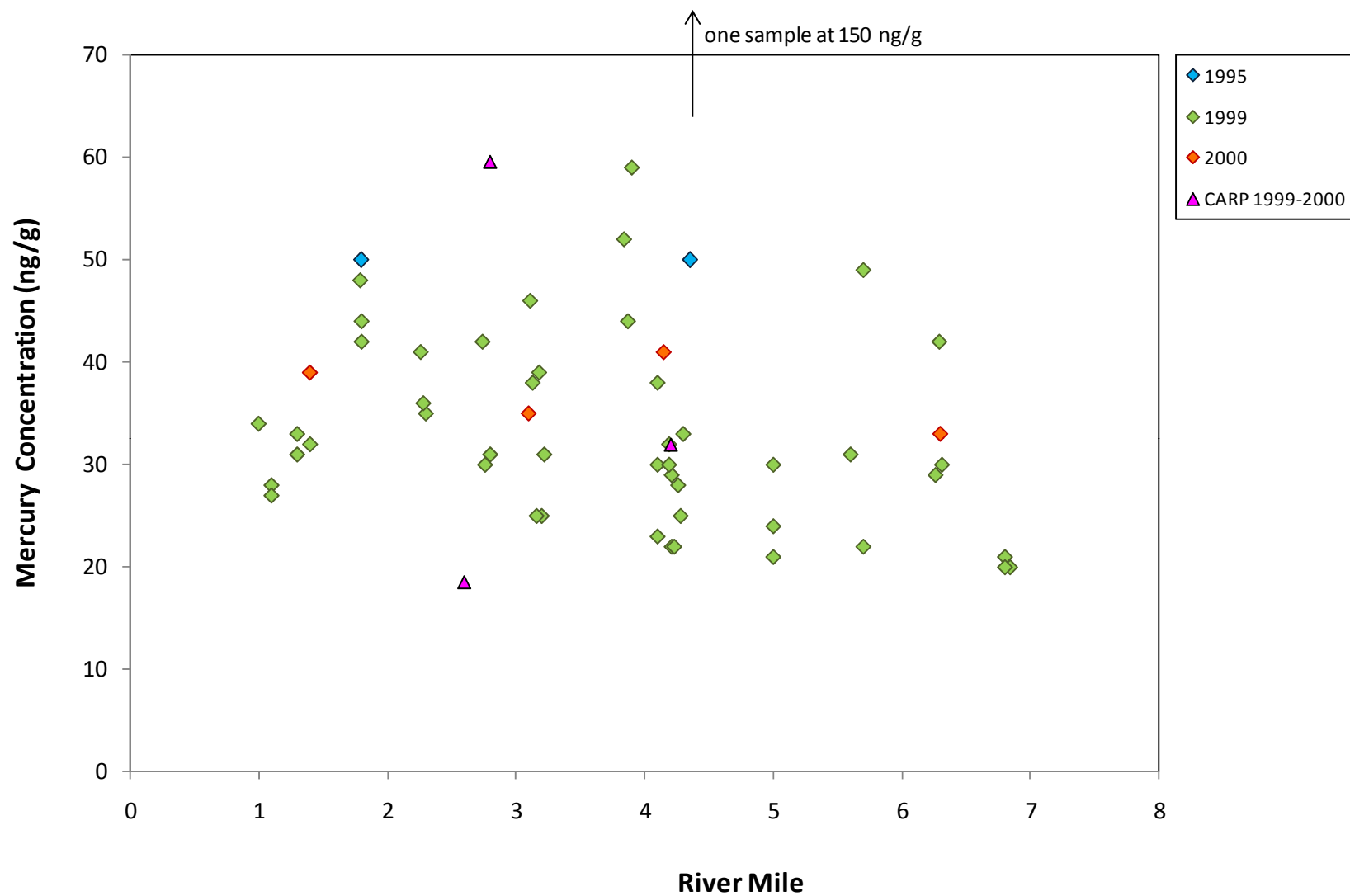


2,3,7,8-TCDD Concentration in Mummichog Tissue vs. River Mile

*Lower Passaic River Restoration Project*

Figure 22-3

2009



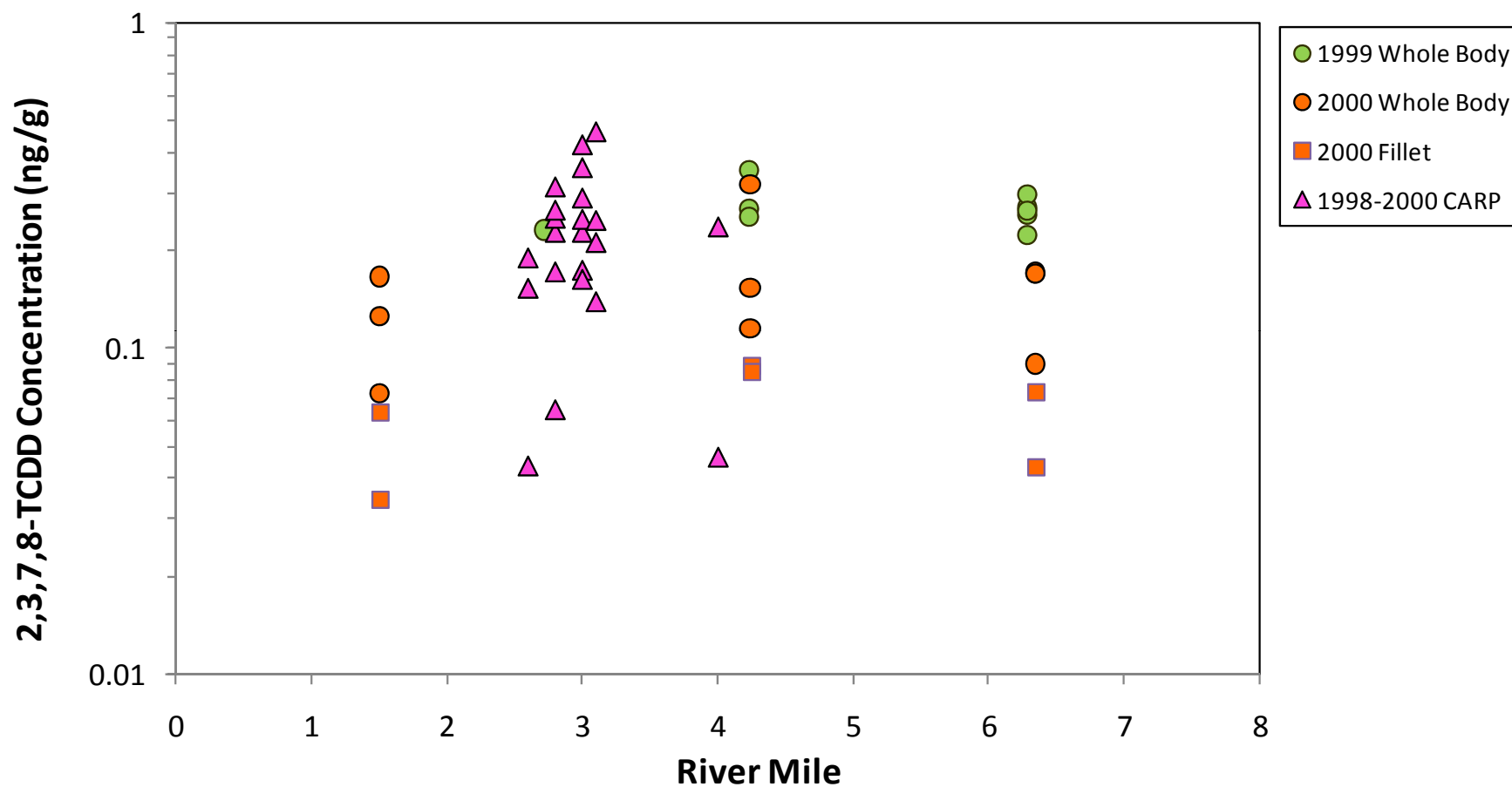
Mercury Concentration in Mummichog Tissue vs. River Mile

Lower Passaic River Restoration Project

Figure 22-4

2009

2,3,7,8-TCDD Concentration in White Perch Tissue vs. River Mile

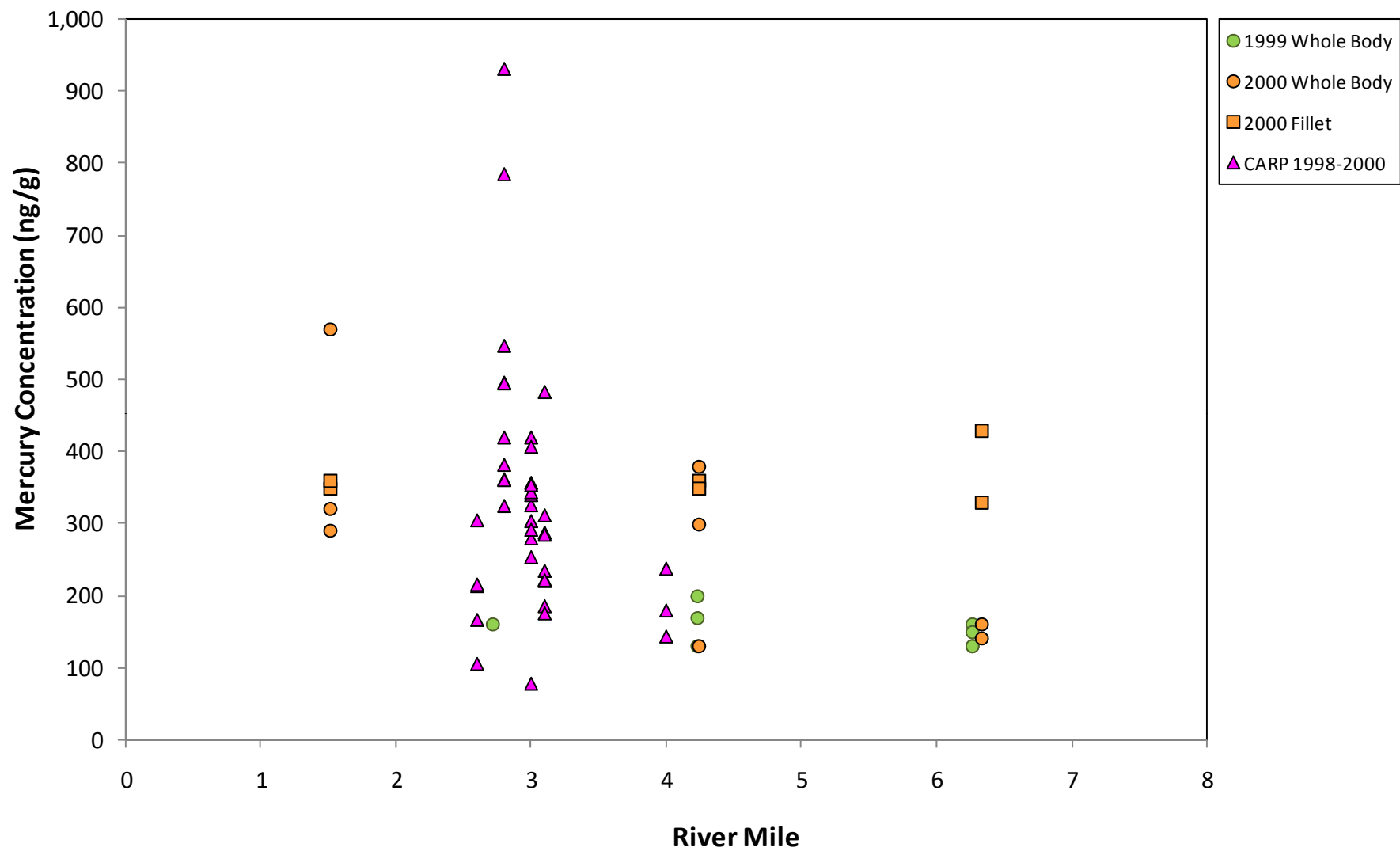


2,3,7,8-TCDD Concentration in White Perch Tissue vs. River Mile

Lower Passaic River Restoration Project

Figure 22-5

2009

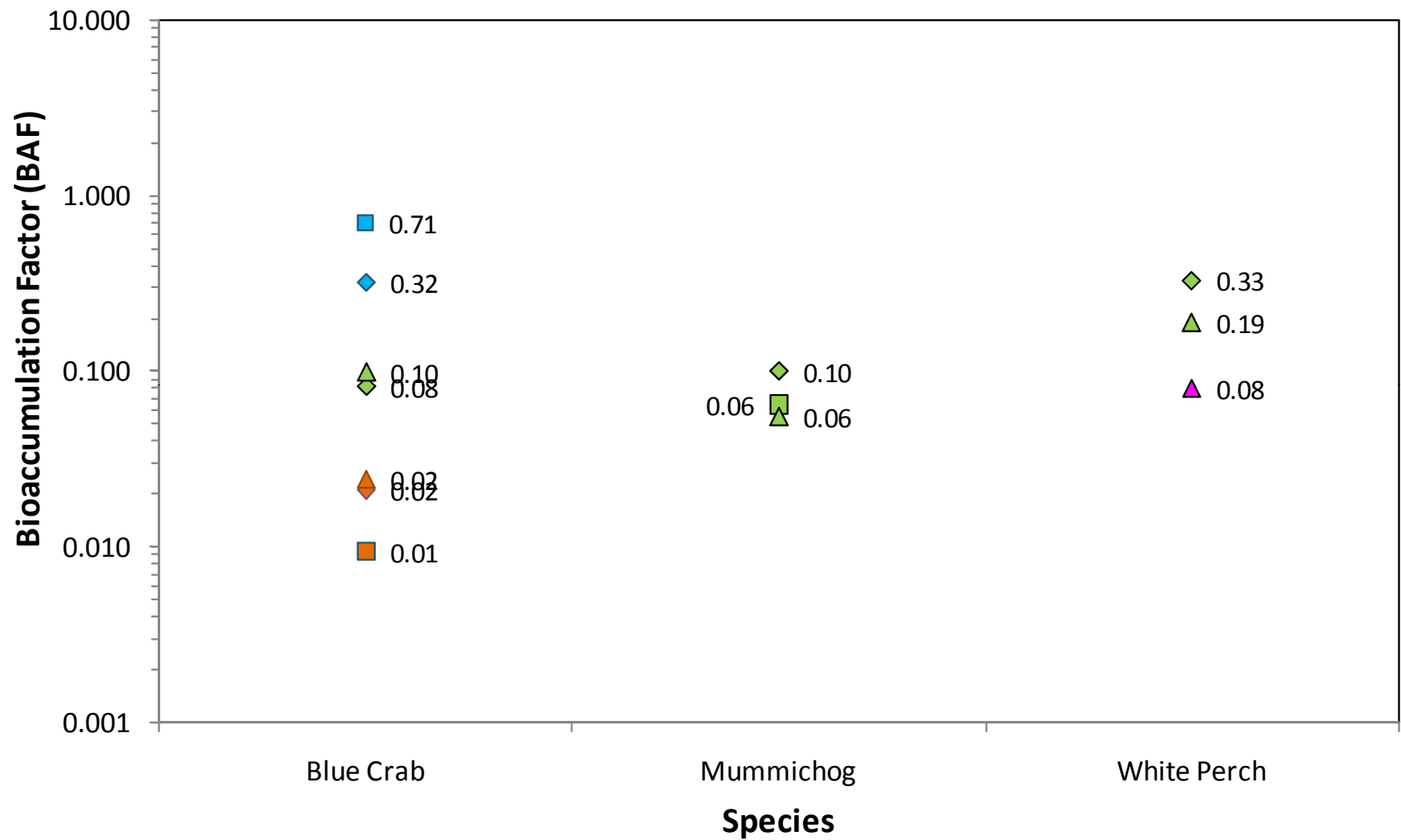


Mercury Concentration in White Perch Tissue vs. River Mile

*Lower Passaic River Restoration Project*

Figure 22-6

2009

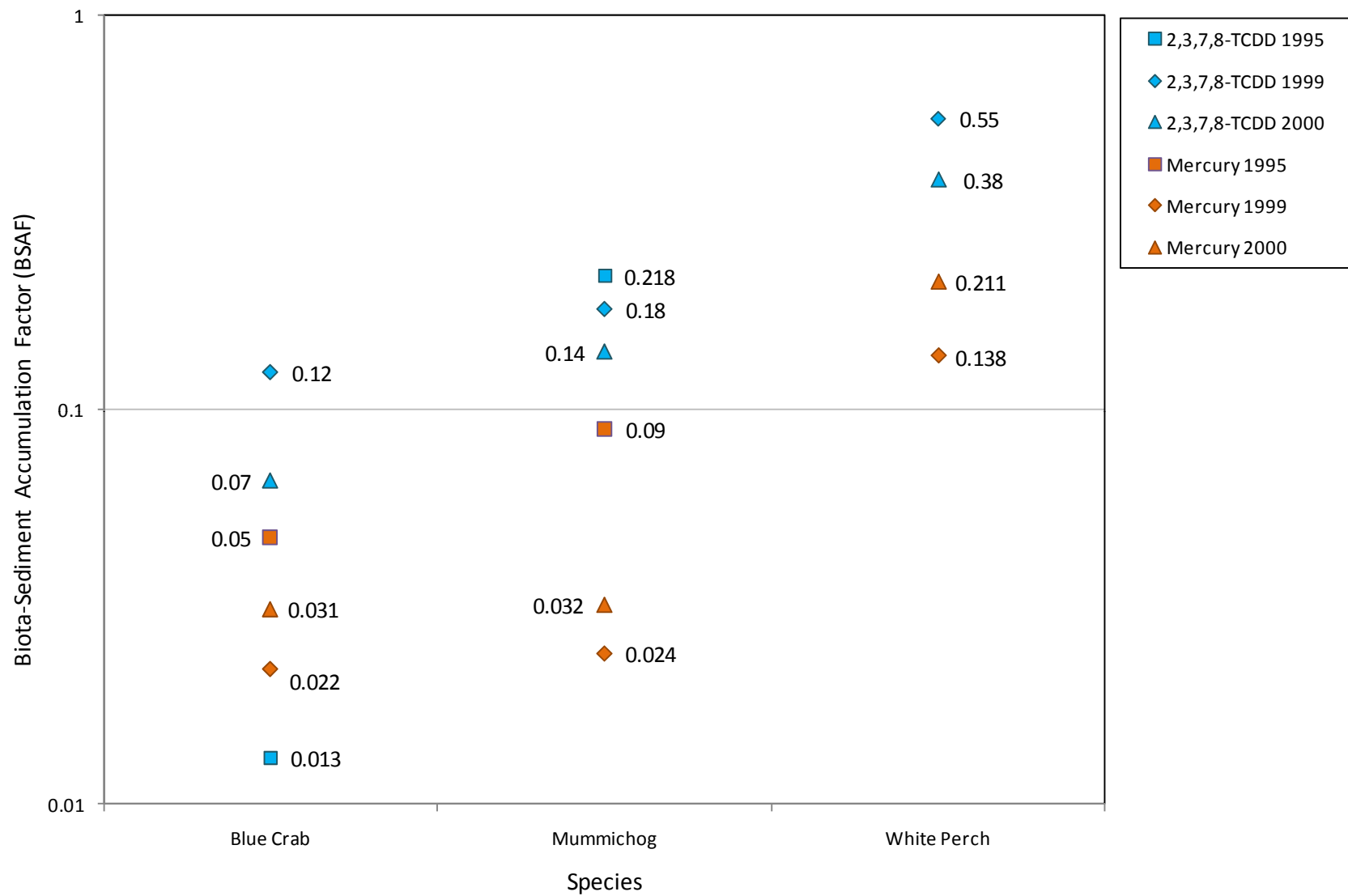


Lower Passaic River Average Bioaccumulation Factors (BAFs) for 3 Species  
for 2,3,7,8-TCDD and Mercury for the years 1995, 1999 and 2000

*Lower Passaic River Restoration Project*

Figure 22-7

2009



Lower Passaic River Average Biota-Sediment Accumulation Factor (BSAF) values for 3 Species for 2,3,7,8-TCDD and Mercury for the years 1995, 1999 and 2000

*Lower Passaic River Restoration Project*

Figure 22-8

2009